

2010 University of Arkansas Combined Research and Extension Annual Report of Accomplishments and Results

Status: Accepted

Date Accepted: 06/13/2011

I. Report Overview

1. Executive Summary

Agriculture is vital to the diverse economy of Arkansas as well as to our very identity as "The Natural State." Over a quarter of a million Arkansans work in jobs generated by Arkansas agriculture and these workers receive approximately 15 percent of the state's total labor income. Agriculture powers the Arkansas economy. Including multiplier effects, agriculture provides \$15 billion or approximately 16 percent of all value-added in Arkansas. Value added includes payments to workers plus indirect taxes and other property-type income such as payments for rents, royalties and dividends. Labor income is estimated at \$9.16 billion or more than 15% of the state's total labor income.

The University of Arkansas Division of Agriculture maintains its roots in the agriculture community while branching out to help enrich the lives of our neighbors. Drawing on lessons learned through our research, we utilize our outreach skills to afford Arkansans access to cutting-edge, sound, and unbiased information and knowledge. We are uniquely positioned to do so because of our physical presence in communities in all 75 counties of our state, including five Research and Extension Centers and seven Branch Experiment Stations, and our stakeholder-driven approach to programming.

Eleven planned program areas represent the diverse needs of the state and include Childhood Obesity; Climate Change; Economics & Commerce; Families, Youth, & Communities; Food, Nutrition, & Health; Food Safety; Global Food Security & Hunger; Natural Resources & Environment; Pest Management; Non-Food Related Plant & Plant Products; and Sustainable Energy. FY2010 Impact highlights include:

Economics & Commerce

Arkansas is a rural state and the recent recession exacerbated the loss of non-agricultural jobs in rural areas of the state. Local leadership, strategic planning (Breakthrough Solutions), business assistance (APAC) and entrepreneurship programs were tailored to assist rural communities and regions maintain and create new jobs that utilize local resources.

Division of Agriculture educational efforts provided Arkansas consumers with money management knowledge and skills that are critical to maintaining financial security. Specific programs helping adult consumers make the most of their household food budgets resulted in 279 consumers saving \$32,603 over a 15 week or less period. High school students participating in personal finance simulations demonstrated increased understanding about credit and budgeting.

Arkansas agricultural producers find themselves in a turbulent marketing environment, requiring a better understanding of budgeting and commodity marketing. An educational curriculum consisting of cash marketing, marketing plans, technical analysis, futures and options, market outlook, and other marketing related skills such as identifying production costs and determining break-even prices was developed and implemented through a small group setting. Participants extended their knowledge and confidence by providing leadership for marketing clubs and many reported the adoption of a written marketing plan.

Childhood Obesity

Obesity has reached epidemic proportions with over a third of the US population weighing in as obese (indicated by a BMI of 30 kg/m² or higher). Arkansas has responded with several programs encouraging Arkansans to move more and learn about healthy lifestyles.

The Walk Across Arkansas program included 2,134 participants walking a total of 429,509 miles. Eighty-five percent of participants reported the program helped them increase physical activity. Other improvements in health and well-being were reported as well. Based on research stating that 1,000 steps taken saves \$1 in healthcare costs, participants contributed to a potential healthcare savings of \$859,018 in 2010.

Reshape Yourself, a 15 week program conducted in 13 counties, supports the idea that people of all shapes and sizes can improve health by adopting healthy practices. The program experienced a seventy-six percent (76%) graduation rate. The average weight loss was 11.8 pounds. 90% of participants altered their behavior to follow standard serving sizes and 84% increased their walking activity.

In all 75 counties, nutrition education classes and other activities were designed to help Supplemental Nutrition Assistance Program (SNAP) participants, and those eligible to receive SNAP benefits, make healthy food choices, stretch their food resources and lead a physically active lifestyle. As a result of this nutrition education, 87% of parents surveyed following the completion of the program reported that their families were eating more fruits and vegetables; 85% of parents consumed more water; and 81% were more active.

Food science researchers at the University of Arkansas demonstrated that the nutritional value of rice can be enhanced through parboiling processing to increase the slowly digestible starch and resistant starch content. With current consumers becoming more health conscious, such a product can provide a wider market for nutraceutical and functional foods, and benefit consumers.

Families, Youth & Communities

Arkansas averages more than 15 ATV-related deaths every year and has one of the nation's highest rates of injury for youth 16 years and younger. The Division's 4-H youth development program offers the ATV Safety Institute's (ASI) program to help youth and adults learn to safely and properly ride ATV's.

Twenty-one Division faculty and staff were trained to teach the five-hour ASI RiderCourse and as a result, 338 youth and adults have gone through the RiderCourse and over 1,000 youth have participated in classroom ATV safety education. This program is made possible through partnerships with many businesses, state agencies, and other organizations.

Child care professionals in Arkansas are required to obtain a minimum of 10 hours of verified training annually and the Division of Agriculture is a major provider of this professional training. Three programs have been developed and offered free of charge: The Best Care program, providing 10 hours of classroom style training; Best Care Connected, providing 5 hours of online training; and Guiding Children Successfully, providing 30 hours of video and text-based self study. With an estimated value of \$15 per training hour, the training programs saved child care professionals \$405,255 in training costs in 2010.

Leadership development is at the heart of many of our programs. A specific example of the impact of a county's Youth Leadership program is typified by this school counselor's comments: "The Marion County Youth Leadership program has had a great impact on many of our students. It has given them a chance to participate in character and confidence-building activities and to interact with their peers and with local and state leaders. The Youth Leadership program gives some of these students their first taste of the 'real world' and helps them begin to see leadership possibilities for themselves in that world."

Food, Nutrition, & Health

Medication misuse costs the nation well over \$177 billion annually. The latest statistics reflect that Arkansas has the highest rate of teen prescription drug abuse in the nation. The Division has responded through a medication literacy awareness initiative, "Be MedWise Arkansas." Over fifteen hundred Arkansans have attended at least one class and learned important drug use and storage information. Seventy-three out of 75 counties registered to participate in National Take Back Day and 5,407 pounds of pills were collected.

Strong Women is an evidence-based community strength-training program, offered in 37 counties. Trained volunteers instructed an estimated 14,000 exercise sessions reaching 42,119 total contacts. Fitness test data shows improved upper and lower body strength, improved balance, improved upper and lower body flexibility and increased aerobic endurance. Among other impacts, this program saves participants nearly \$1.2 million dollars each year compared to the cost of fitness center membership.

Division researchers are studying ways to recover beneficial procyanidins from cranberries potentially wasted during the juicing and canning processes. The alkaline hydrolysis method can be used industrially to recover procyanidins from waste materials to be used in dietary supplements or fortification processes.

Global Food Security & Hunger

Roy J, a superior long grain rice variety was released for planting in 2010. The Division's commitment to Arkansas rice farmers was enhanced by the formation of a hybrid rice breeding program in 2010 in cooperation with breeders from Louisiana State, Texas A&M, Southeast Missouri State and Mississippi State.

AR 7124, a medium grain rice variety was released to the public in 2010. Rice, soybean, cotton and ornamental germplasm was released from their respective breeding and improvement programs in 2010.

Victoria Red, a new grape variety was publicly released from the Small Fruits breeding program in 2010.

Arkansas is the fourth worst state in the nation for food insecurity. According to a USDA report, 17.9% of all households do not have access at all times to enough food for an active, healthy life for all household members. The Arkansas EFNEP program provides one-on-one and group education within 12 priority counties and overall, 1,573 participants completed the program. Over half of the participants (876) reported they seldom run out of food before the end of the month, as a result of the program.

Corn acreage has expanded in Arkansas as corn prices have risen and producers see the benefit of including corn in crop rotations. The Arkansas Corn Verification program allows producers to reach maximum yields and experience the benefits of following Division of Agriculture production recommendations. Verification program yields averaged 204 bu/acre opposed to the state average of 150 bu/acre, a \$270/acre gain in gross revenue for producers.

An estimated 350,000 acres of soybeans were infested with glyphosate-resistant Palmer amaranth (pigweed) in Arkansas in 2010. In 2009 and 2010, a Roundup/LibertyLink Systems Comparison study was conducted at two different locations. Yield and other agronomic characteristics were evaluated for each soybean variety. Results have shown that LibertyLink soybean varieties have yields very comparable to some of the highest yielding and popular RoundUp Ready soybean varieties. Use of the LibertyLink/Ingnite system could save producers \$105 million dollars in lost yield due to glyphosate resistant Palmer amaranth.

Poultry, a major agricultural product in Arkansas, is annually valued at almost 3 billion dollars and represents a significant portion of the state economy. As a result of the Division's educational efforts, commercial poultry growers and backyard hobby flock owners recognize that surveillance testing and diagnostic assistance are an integral part of the Biosecurity effort. The Division works with producers and integrators to reduce the risk of disease introduction and/or spread and protect the US food supply.

Honey bee populations have been declining across the country. In an effort to recruit and train new beekeepers, 10 locations around Arkansas hosted Honey Education Short Courses. Designed to present practical beginning beekeeping information and encourage participants to begin keeping bees themselves, interest was apparent with 500 total participants in the classes.

Economic and environmental sustainability are two of the most critical issues facing Arkansas livestock producers. A model farm was established so that producers could see how technology could be applied to real-world farm scenarios. Adoption of management practices such as efficient grazing systems, stockpiling forage, well-designed fertilizer programs, increased targeted use of by-products, and better designed programs for efficient and environmentally sustainable use of poultry litter on pastures were demonstrated and encouraged.

Natural Resources and Environment

More than half of the state is forested and most of this forest land is owned by independent woodland owners. Educating landowners to manage for multiple benefits is a top priority due to the competing demands for forest land.

Economic costs of wildlife damage can be substantial; reducing the risks of such damage provides a win-win for landowners and wildlife. Over 600 contacts were made at local events and meetings concerning wildlife management on private lands. Of 128 participants surveyed, 82 planned to adopt practices designed to minimize wildlife damage.

Pest Management

The Extension Urban Entomology Program provides up-to-date training and educational materials for use with commercial Pest Management Professionals. In 2010, 405 licensed individuals received recertification education. Approximately 60% passed, allowing them to get pest control licenses.

From July to early August, adult green June beetles often mass attack and destroy ripening fruit. Most insecticides cannot be used due to the potential for toxic residue on harvested fruit. Division researchers tested a low-cost trap (\$2.50 per trap per season) to detect the presence of June beetles and found it to be an effective, allowing the grower to selectively apply insecticide sprays and protect the crop.

In 2010, Extension Entomologists conducted soybean scouting schools to educate growers and decision-makers on the importance of insect scouting to insure growers do not lose yield potential because of insects. One hundred and forty-two growers, consultants, and others in the field participated. Recent reports indicate that scouted acreage has increased over 20% from 5 years ago.

Brassica cover crops as an economical alternative to soil fumigation in cotton was explored in 2010 by Division plant pathologists under a jointly funded project from the Cotton Foundation and the USDA Sustainable Agriculture Research and Education program.

Plant & Plant Products (Non-Food Related)

One hundred and thirty-five days is the average hay feeding period in Arkansas, but by improving forage and grazing management practices, producers can reduce that to 65 days or less. The 300 Day Grazing Program is a statewide demonstration program designed so an agent can work with a producer to implement one of eight different forage management practices to extend their grazing season.

The interest in buying locally grown agricultural products has grown tremendously in the US and is reflected in the increased number of farmer's markets. Division collaborative efforts are focused on production and marketing risks emphasizing the transition to new production systems. As a result of participating in this project, growers are in a better position to manage overall production and price risks.

Introduction of new technologies and seed treatments brought the cost of a bag of cotton seed to \$550 per bag in 2010. At \$100-120 per acre for seed, planting is the most expensive application during a cotton season. Soil variability and seeding rates were studied and the preliminary results indicate that higher seeding rates were required in heavier soil types to acquire an even stand, while sandy soil textures required less seed. Considering there are at least 200,000 acres of fields with enough variability to apply this technology, the savings in seed costs could reach \$4 million dollars annually for producers.

Food Safety

L. monocytogenes has been strongly linked to the consumption of deli foods and meats sliced in the deli. Division researchers evaluated various methods of cleaning and sanitizing the deli slicer, as well as different cleaners and sanitizers. Results of the study have immediate implications for practice.

Current research is focused on salmonellae metabolism and genetic regulation of stress responses when grown under processing conditions to determine how these overlap with expression of virulence when foodborne *Salmonella* spp. become pathogenic. Outcomes have implications not only for persistence of foodborne salmonellae in processing, but raise practical issues regarding choices of antimicrobials as intervention steps in processing.

During FY2010 the Division of Agriculture addressed a multitude of cross-cutting issues, through a broad range of research and Extension programs. An increasing number of the Divisions' efforts are multi-disciplinary and integrated. The Division's administration and faculty have committed time and resources from federal, state, county, city, and private sources to address diverse and complex priority issues for Arkansas and our federal partners. The Division serves stakeholders in all walks of life by helping to ensure the safety and security of our food and fiber system; improve the health and nutrition of Arkansans; conserve and sustain natural resources; and expand horizons for youth, families and communities.

Respectfully submitted,

Dr. Mark J. Cochran, Vice-President for Agriculture, University of Arkansas

Dr. Tony E. Windham, Associate Vice President

Dr. Richard Roeder , Associate Vice President

Total Actual Amount of professional FTEs/SYs for this State

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	452.0	0.0	122.7	0.0
Actual	349.1	0.0	118.4	0.0

II. Merit Review Process

1. The Merit Review Process that was Employed for this year

- Internal University Panel
- External University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Combined External and Internal University External Non-University Panel
- Expert Peer Review
- Other

2. Brief Explanation

Programs went through a three-tiered review process:

1. Stakeholder program identification and review
2. Administrative approval and review
3. External review

Stakeholder Program Identification and Review

Stakeholder input into program identification and review were derived from both formal and informal means for all program areas. Public comment on current and future extension and research programs was obtained from county and community meetings, commodity and community associations, commodity check-off boards, state legislative committees and open public forums concerning specific issues. Open public meetings, field days and county and regional production meetings provided forums for stakeholder input open to under-served or under-represented individuals, groups or organizations. For extension, county councils and advisory groups met during the summer of 2010 (at a minimum) to provide input, feedback and/or review of program implementation, redirection, or newly identified needs. Members of these groups were invited to participate in programs, field days, special tours, workshops and conferences throughout the year and for the duration of the program. All reviews of research and extension programs included a stakeholder member or members of the community or industry most influenced by the program area. Open public forums were held to address specific issues of importance to the stakeholder community or industry.

Administrative Approval and Review

Identified planned program areas for research and extension activities were administratively reviewed and approved by the Director of the Agricultural Experiment Station and/or Cooperative Extension Service, as appropriate, within the context of the Division of Agriculture's Strategic Plan and the specific needs identified by stakeholder groups. Smith-Lever, Hatch, McIntire-Stennis, Animal Health and regional research projects were administratively reviewed and approved by the subject matter department head and the director of the Arkansas Agricultural Experiment Station. All research projects were reviewed by three outside scientists prior to submission to the respective subject matter department head and the experiment station.

External Review

Merit review is conducted as part of Division of Agriculture's on-going program review process. The reviews have been departmental or programmatic and cut across departments. Reviews are scheduled on a five to seven year cycle and conducted concurrently for research, extension and instruction. All reviews have been conducted by a team of recognized outside research, extension and teaching professionals balanced to reflect the programmatic needs and diversity. All reviews include one or more stakeholders. The actual review process involves a period of self study, followed by program assessment and bench marking. The review team evaluates the programs' effectiveness relative to the stated mission and goals of the department or program as well as the need of stakeholders. Following the outside review teams' written evaluation, the department or program prepared a response to the review. The Division of Agriculture and University administration then met with the department or program faculty one more time to develop a plan for implementing changes. Thereafter, annual progress was reported to Division and University administration.

III. Stakeholder Input

1. Actions taken to seek stakeholder input that encouraged their participation

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups

- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to non-traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public
- Other (County Council planning meetings.)

Brief explanation.

The University of Arkansas Division of Agriculture has utilized both formal and informal mechanisms for ensuring the planned programs address areas of strategic importance to the state. Each planned program was identified based on the needs identified in a series of regional and statewide listening sessions of current and potential stakeholders representing the diversity of the population in the regions and state. Stakeholders of specific programs such as Community Health, 4-H and Youth, and commodity groups, research and extension faculty and staff also identified needed programs and in some cases provided partial funding support. Single issue meetings were held as needed to address emerging issues to craft additional program responses if needed to promptly address the problem.

2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them

1. Method to identify individuals and groups

- Use Advisory Committees
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys
- Other

Brief explanation.

In 2010 the University of Arkansas Division of Agriculture sought input from diverse stakeholder groups. Stakeholders serve on county councils, advisory committees, and boards that advise and oversee the work of the Division. Individuals and stakeholder groups were identified by Arkansas Experiment Station faculty and administrators and by asking county Extension staffs to identify individuals in their local communities who were representative of one or more of the following fifteen stakeholder categories: county services (e.g., DHS, Food Bank or Pantry); financial sector (e.g., banks, agricultural lending, investments); faith-based sector (e.g., church, youth minister); education (public, private, vocational); commercial sector (e.g., chambers of commerce, industry); health (e.g., hospital, public health, doctor); agricultural production; agricultural businesses; county Extension council; 4-H program (e.g., leader, teen, alumni, foundation); government official (e.g., county, city); Extension homemaker; natural resources (e.g., wildlife, forestry, conservation); media (e.g., radio, newspaper, television); and youth services (e.g.,

community center, youth organizations). In addition to these criteria, Extension staffs were also asked to identify individuals within the fifteen categories who were representative of the gender, racial, ethnic, and socioeconomic demographic make-up of the counties.

2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Survey specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public
- Other (Meeting with regulatory groups, state agencies, & commodity prom)

Brief explanation.

During the summer of 2010, extension faculty met with county council members and program sub-committees to identify local needs for the program planning year beginning October first. County profiles developed by state faculty were utilized to examine a diversity of needs and to understand the changing demographics within each county. Stakeholder-developed materials, such as the Farm Bureau policy development process were used to identify research needs. Several priority-setting activities were scheduled during 2010 with specific commodity or stakeholder groups to seek input on the research planning process.

In addition to the standard methods of obtaining stakeholder input described above, in 2010, the University of Arkansas Division of Agriculture updated its strategic plan. As part of this update, the Division conducted a state-level external stakeholder listening session and an online survey of external stakeholders from across the state. A total of 172 external stakeholders participated in these processes. Specific surveys were conducted with individuals representing underserved or under represented groups, women in agriculture and small farm operation producers. Policy makers and key community and state organizational leaders considered critical and emerging needs within our state, and the role of the Division in addressing those needs.

3. A statement of how the input will be considered

- In the Budget Process
- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs

- In the Staff Hiring Process
- In the Action Plans
- To Set Priorities
- Other (Strategic Planning)

Brief explanation.

Research and extension faculty and scientists met with UA Division of Agriculture administration to discuss stakeholder needs solicited at meetings throughout the year. Identified needs were integrated into the extension and 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.

Stakeholder representatives served 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 were 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.

Brief Explanation of what you learned from your Stakeholders

Stakeholders want to be involved. Due to the size and scope of the University of Arkansas Division of Agriculture, reporting all specific stakeholder feedback would exceed the space allocation for this item. Stakeholders participate in establishing annual Cooperative Extension program priorities for each of the 75 counties in Arkansas. Stakeholders are involved in identification of research needs and priorities.

During the statewide listening session in support of our new five year strategic plan, over 170 policy makers and key community and state organizational leaders considered critical and emerging needs within our state, and the role of the Division in addressing those needs. This group voiced their concerns about population changes across the state and challenges facing communities in a competitive economy. We heard comments concerning the different issues Arkansans must struggle with every day, including maintaining a competitive edge in agriculture and childhood health and obesity.

The following emphasis areas were identified:

- Agricultural Production & Processing
- Environment, Energy & Climate
- Access to Safe & Nutritious Food
- Increasing Opportunities For Families & Youth
- Economic & Community Development

The Division's 2011-2015 Strategic Plan outlines the specific objectives for each area and is based on what we learned from our stakeholders.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
5788362	0	3850148	0

2. Totaled Actual dollars from Planned Programs Inputs				
Extension			Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	4361839	0	3850148	0
Actual Matching	5788362	0	3904412	0
Actual All Other	39485602	0	54136098	0
Total Actual Expended	49635803	0	61890658	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover				
	1892549	0	0	0

V. Planned Program Table of Content

S. No.	PROGRAM NAME
1	Families, Youth, & Communities
2	Agricultural and Food Biosecurity (Reported In Other Programs)
3	Agricultural Systems
4	Animals & Animal Products
5	Economics & Commerce
6	Food, Nutrition & Health
7	Natural Resources & Environment
8	Pest Management
9	Plants & Plant Products (Non-Food Related)
10	Technology & Engineering
11	Climate Change
12	Sustainable Energy
13	Food Safety
14	Childhood Obesity
15	Global Food Security and Hunger

Add previously unplanned program

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Families, Youth, & Communities

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	47%		47%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	6%		4%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	0%		2%	
806	Youth Development	47%		47%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	185.3	0.0	3.6	0.0
Actual	129.2	0.0	3.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1613881	0	767	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2141693	0	778	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
14609673	0	865332	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Division of Agriculture research programs address family relationship and youth development issues in close collaboration with state and federal agencies and policy makers.

Family, Youth, & Communities educational programs within the University of Arkansas - Division of Agriculture include events and activities in the areas of Family & Consumer Science and 4-H Youth Development.

Family & Consumer Science programs provide educational topics that help Arkansans get the most for their money; eat well and stay healthy; raise caring, responsible children; and have strong families and strong relationships.

4-H Youth Development programs 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.

Leadership development programs provide research-based education for current and emerging community and state leaders. Participants include youth, county residents and lay leaders, civic groups, quorum court members and other elected officials, volunteers and Extension Homemakers.

Methods for providing programs entail:

- Workshops
- Training Sessions
- One-to-one counseling
- Develop curriculum
- Presentations
- School enrichment programs
- Organize 4-H clubs
- Train-the-Trainer
- Committee Meetings
- Hard-copy fact sheets
- Newsletters
- Video and compressed video
- Radio, television and print media

2. Brief description of the target audience

- Adolescents and adults
- Adolescents and adults who expect to become parents
- Parents
- Grandparents
- Caring for the elderly
- Step parents
- Foster parents
- 4-H members
- 4-H youth participants
- 4-H volunteers
- 4-H parents
- Non-4-H adults
- School teachers
- County Extension faculty
- County FCS Agents
- Extension Homemakers Council members and trainers

All married couples or those couples considering marriage
 Child care providers
 Local, state, and community leaders
 Elected officials

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	175900	148750	285700	51450
Actual	121968	342180	256252	119303

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	0	15	
Actual	4	11	15

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of parent education programs/trainings held

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	55	39

Output #2

Output Measure

- Number of participants in parenting programs/training

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	4000	742

Output #3

Output Measure

- Number of hours of parenting program self-study training completed (GCS)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	500	462

Output #4

Output Measure

- Number of marriage education programs/trainings held

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10	7

Output #5

Output Measure

- Number of participants in marriage programs/trainings

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	500	98

Output #6

Output Measure

- Number of organized 4-H Clubs

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	875	810

Output #7

Output Measure

- Number non-duplicated participants in 4-H Youth Development Healthy Lifestyles programs

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	11000	5053

Output #8

Output Measure

- Number non-duplicated participants in 4-H science, technology, engineering & math programs

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1600	14023

Output #9

Output Measure

- Number of Child Care trainings held (Best Care)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	115	76

Output #10

Output Measure

- Number of Child Care online courses offered (BCC)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	2	2

Output #11

Output Measure

- Number of hours of Child Care self-study training completed (GCS)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1500	5620

Output #12

Output Measure

- Number of federal grants and contracts

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	5	11

Output #13

Output Measure

- Number of Families, Youth & Communities clientele contacts from education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational

methods

- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	175900	378035

Output #14

Output Measure

- Number of non-duplicated participants in parenting program self-study training (GCS)

- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	50	64

Output #15

Output Measure

- Number of non-duplicated participants in Child Care self-study training (GCS)

- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	500	665

Output #16

Output Measure

- Number of participants attending a babysitting course

- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	100	21

Output #17

Output Measure

- Number of participants completing online child care provider training (BCC)

- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	850	1515

Output #18

Output Measure

- Number of participants completing traditional child care provider training (BC)

- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1900	1828

Output #19

Output Measure

- Number of Marriage Garden folders circulated
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	250	4739

Output #20

Output Measure

- Number of See the World Through My Eyes publications circulated
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	500	5057

Output #21

Output Measure

- Number of Personal Journey maps circulated
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	200	5057

Output #22

Output Measure

- Number of non-duplicated participants in Best Care Child Care training
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1500	1828

Output #23

Output Measure

- Number of non-duplicated participants in BCC Child Care training
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	500	1515

Output #24

Output Measure

- Number of Parenting Journey maps circulated

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10000	9146

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of 4-H participants who learned accepting differences life skill
2	Number of 4-H participants who learned healthy lifestyles choices life skill
3	Number of 4-H participants who learned self-responsibility life skill
4	Number of 4-H participants who learned leadership life skill
5	Number of 4-H participants who learned marketable skills life skill
6	Number of 4-H participants who learned wise use of resources life skill
7	Number of child care providers who report an increase in knowledge related to specific child care issues after participating in an Extension program
8	Number of participants who increased knowledge through leadership development programs
9	Number of participants adopting an effective parenting behavior/practice
10	Number of participants adopting a targeted relationship-enhancing behavior
11	Number of participants adopting a targeted personal development behavior
12	Number of 4-H Journals completed
13	Number of child care providers adopting a recommended practice after participating in an Extension program
14	Number of volunteer hours contributed through the 4-H program by youth and adults who practice good citizenship and provide community-based leadership
15	Number of participants (youth and adults) who reported conducting programs, community service projects, adopting new skills or accepting new leadership roles as a result of leadership development educational efforts
16	Number of Refereed Journal Publications
17	Number of participants who indicate that they have gained knowledge on a targeted parenting behavior (GCS)

18	Number of participants who indicate that they have gained knowledge on a targeted relationship-enhancing behavior
19	Number of participants who indicate that they have gained knowledge on a targeted personal development behavior
20	Number of 4-H participants who learned decision making life skill
21	Number of 4-H participants who learned communications life skill
22	Number of child care providers who indicate that they have gained knowledge on a targeted child care-giving behaviour (GCS)
23	Number of participants who increased understanding of health and safety as a result of participating in the babysitting program

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of 4-H participants who learned accepting differences life skill

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1250	903

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #2

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of 4-H participants who learned healthy lifestyles choices life skill

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	13500	1124

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Serious ATV injuries affect more than 100,000 people yearly in the United States. Arkansas averages more than 15 ATV-related deaths per year and has one of the nation's highest rates of injury for those 16 and under. Close to 90% of ATV crashes in Arkansas occur with drivers under age 16 driving an adult sized ATV and each year on average 70 patients are admitted to Arkansas Children's Hospital with serious ATV-related injuries. Recent research demonstrates that children under the age of 16 continue to suffer a disproportionate share of injuries, do not wear a helmet, and they fail to receive formal ATV training.

What has been done

Since June 2008 the Arkansas Cooperative Extension Service has been committed to the development and delivery of a statewide 4-H ATV Safety educational program. We currently have 21 University of Arkansas Cooperative Extension Service county staff and state faculty that are licensed instructors to deliver the ATV Safety Institute ATV RiderCourse in each of our three statewide Extension districts. In addition we are providing school and community based ATV safety educational programs to our clientele.

Results

During this past year, more than 338 youth and adults have completed the five-hour hands-on ATV Safety Institute ATV RiderCourse, more than 1,000 youth have participated in classroom ATV safety education, and 100 plus youth and adults have served as community leaders in ATV safety. In addition through media efforts of TV, radio, and print we have had an audience of over three million. Numerous partnerships have been established with groups such as Arkansas Children's Hospital, state agencies, dealerships, and other businesses and organizations to help deliver the program. State dealerships have provided over 40 loaner ATV units for use in delivering the RiderCourse program.

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of 4-H participants who learned self-responsibility life skill

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	4000	1016

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of 4-H participants who learned leadership life skill

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2700	527

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #5

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of 4-H participants who learned marketable skills life skill

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2500	46

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

802 - Human Development and Family Well-Being

803 - Sociological and Technological Change Affecting Individuals, Families, and

804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and

806 - Youth Development

Outcome #6

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of 4-H participants who learned wise use of resources life skill

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	4200	1582

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #7

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of child care providers who report an increase in knowledge related to specific child care issues after participating in an Extension program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	320	3835

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Arkansas' child care professionals are required to obtain a minimum of 10 hours of verified training annually through the Traveling Arkansas' Professional Pathways (TAPP) system to maintain their licensure. If child care professionals are part of the Better Beginnings quality approved rating system they must obtain a minimum of 15 hours of TAPP verified training each year. This means there is a tremendous demand for quality child care professional training in Arkansas. The U of A Cooperative Extension Service meets that need.

What has been done

The U of A Cooperative Extension Service is a major provider of child care professional training in Arkansas. With a grant from the Arkansas Division of Child Care and Early Childhood Education we have developed three training programs, offered free of charge, to address this demand and to better accommodate professionals with different learning needs and styles. The Best Care (BC) program provides 10 new hours of classroom style training annually. Best Care Connected (BCC) provides 5 new hours of online training annually that professionals can complete anywhere and anytime they have internet access. Guiding Children Successfully (GCS) provides 30 hours of video and text based self-study training that professionals can complete on their own schedule.

Results

In 2010, 4,008 Arkansas child care professionals participated in our training programs and successfully completed 27,017 hours of training. With an estimated value of \$15 per training hour, our child care professional training programs saved Arkansas child care professionals \$405,255 in training costs in 2010.

Evaluation results for 2010 indicate that 96% (3,835) of child care professionals trained strongly agreed or agreed that their knowledge of effective child care practices had increased as a result of our trainings. Eighty percent (3,061) of participants strongly agreed or agreed they would do one or more new things to be a better child care professional as a result of our trainings.

In addition, analysis from paired samples T-tests revealed that both Best Care and Best Care Connected participants in 2010 had statistically significant increases ($p < .001$) in their levels of understanding of each of the lesson topics from Time 1 (before participation in our training) to Time 2 (after participating in our training).

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #8

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of participants who increased knowledge through leadership development programs

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3500	2721

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Leaders are not born, they are developed. The South Shore Marion County Youth Leadership program was established to help achieve this. Goals are to: 1) Establish an emerging pool of competent leaders for Marion County, 2) Establish and maintain a long term relationship between participants and advisory committee members, 3) Develop and maintain an alumni association for graduated participants, 4) Involve participants in choosing, planning and implementing a leadership team project to improve Marion County, 5) Inform and challenge participants as to the needs and opportunities of Marion County, and 6) Challenge young people to take an active role in their communities.

What has been done

Students entering each of the three Marion County High Schools in the ninth grade are offered the opportunity to become a member of the South Shore Marion County Youth Leadership Team. Twenty-one students are selected to participate each year. This program offers them the avenue to explore and develop skills needed to become leaders as well as successful contributing adults. An Advanced Youth Leadership 4-H Club has been established as a means to continue to work with graduated students while they are still in high school and to offer more chances to learn and develop leadership skills.

Results

More of our graduates further their education upon graduation than the average school population. A local guidance counselor stated that their school is located in a small rural economically depressed community where opportunities are limited. She stated: "The Marion County Youth Leadership program has had a great impact on many of our students. It has given

them a chance to participate in character and confidence-building activities and to interact with their peers and with local and state leaders. The Youth Leadership program gives some of these students their first taste of the "real world" and helps them begin to see leadership possibilities for themselves in that world. It is an invaluable source of positive role models and experiences." "One student showed leadership tendencies all through school but had learning disabilities in math, reading, and written expression. Her participation in Youth Leadership boosted her confidence early on so that she was more comfortable taking advantage of other opportunities in high school. She wound up successfully graduating from high school and has enrolled in a 4-year college far away from home, something very unusual for one of our students."

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #9

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of participants adopting an effective parenting behavior/practice

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1500	672

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #10

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of participants adopting a targeted relationship-enhancing behavior

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	155	87

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #11

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants adopting a targeted personal development behavior

2. Associated Institution Types

- 1862 Extension
 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
 Change in Action Outcome Measure
 Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	225	313

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
 803 - Sociological and Technological Change Affecting Individuals, Families, and
 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
 806 - Youth Development

Outcome #12

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of 4-H Journals completed

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	750	756

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #13

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of child care providers adopting a recommended practice after participating in an Extension program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	200	3061

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #14

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of volunteer hours contributed through the 4-H program by youth and adults who practice good citizenship and provide community-based leadership

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	40000	107053

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #15

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants (youth and adults) who reported conducting programs, community service projects, adopting new skills or accepting new leadership roles as a result of leadership development educational efforts

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2000	2203

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In order to improve the quality of life in Arkansas, strong leaders are needed across the state, in both rural and urban areas. It is important that these leaders have a knowledge and understanding of the economic and social changes affecting Arkansas, and are able to practically employ leadership skills and expertise in addressing critical problems facing Arkansas communities.

What has been done

The LeadAR program is a two year life-changing event for emerging Arkansas leaders. Training is on basic skills in communications, interpersonal relations, networking, economics, policy formation, role of government, and social and cultural understanding. Participants explore the legislative process; the long-term effects of our government's agriculture, trade, and economic policies; and current issues facing our state in education, health, water, economic development, and criminal justice. The program consists of 11 three-day seminars. Each class participates in a twelve day study tour to another state and Washington, D.C. to learn about issues beyond our

borders and those affecting our nation. If funds are available, each class also participates in a two week study tour to a foreign country.

Results

Class members are required to complete community projects of their own choosing. Member Chris Hiryak set a LeadAR goal to help youth learn about growing healthy food and changing their diets. He spearheaded an effort resulting in an award of more than \$2 million from the U.S. Department of Agriculture for the Delta Garden Study. Mabelvale Magnet Middle School is the pilot school; Hiryak is the school's garden manager. The program will be expanded to nine schools in the Mississippi Delta of eastern Arkansas. The study will examine if gardening at school can help adolescents be more physically active and eat more fruits and vegetables, and if school gardens can play a role in reducing behavioral problems. Ten schools without gardens will serve as controls so researchers can compare results. Researchers chose Mabelvale because it's demographically similar to Delta schools, with a large number of students living in poverty, large numbers of youth who are overweight or obese, and a high percentage of minority students. Other partners include Arkansas Children's Hospital Research Institute and the USDA Agricultural Research Service's Delta Obesity Prevention Research Unit.

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #16

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of Refereed Journal Publications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	15	11

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

As people advance into old age, they are increasingly likely to experience challenges to their well-being. Also, the youngest members of the Baby-Boomer Generation will reach the age of 65 in 2011. It is expected that the proportion of the population aged 65 years old and older will nearly double to 20.4% by 2030. Two particular areas of need were identified. These included maintaining physical activity, especially for older persons with age-related physical disabilities and those in long-term care facilities. Maintaining physical activity is related to better health in late life and lower levels of disability and depression. The second area of need is to maintain cognitive function in late life.

What has been done

To more fully understand the issue of maintaining physical activity for older persons in long-term care facilities, 44 activity directors in long-term care facilities were surveyed on what kinds of activities were provided, as well as their perceptions of participation. Directors were also asked what kinds of things that they would do if they did not face administrative and cost restraints. Preliminary data analyses show that activities are focused on relatively low levels of physical activity, not all which can be explained by physical disabilities. Activity directors reported high levels of dissatisfaction with levels of participation, especially in regards to men's participation. Most activity directors desired activities that would allow them to do more outings.

Results

These data suggest that activity directors may benefit from programs that assist them to be creative in providing physically and cognitively demanding activities for long-term care residents. Although more research is needed to better understand administrative constraints of activities provided by activity directors, this research suggests that long-term care residents would benefit by focusing on the experiences and limitations of activity directors in long-term care centers. Importantly, providing programs for activity directors in long-term care facilities is an efficient way of improving the physical, mental, and cognitive health of older persons in those centers.

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #17

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants who indicate that they have gained knowledge on a targeted parenting behavior (GCS)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	45	850

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #18

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants who indicate that they have gained knowledge on a targeted relationship-enhancing behavior

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	220	103

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #19

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants who indicate that they have gained knowledge on a targeted personal development behavior

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	461

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #20

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of 4-H participants who learned decision making life skill

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	800	2435

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #21

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of 4-H participants who learned communications life skill

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2750	1130

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

802 - Human Development and Family Well-Being

803 - Sociological and Technological Change Affecting Individuals, Families, and

804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and

806 - Youth Development

Outcome #22

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of child care providers who indicate that they have gained knowledge on a targeted child care-giving behaviour (GCS)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	465	665

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

Outcome #23

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants who increased understanding of health and safety as a result of participating in the babysitting program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and
- 806 - Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Fuel prices & loss of personnel)

Brief Explanation

Output 1- Number of parent education trainings held: Still working to develop broader program implementation and effective/consistent reporting practices.

Output 2 - Number of participants in parenting training: Over-targeted number of course participants.

Output 3 - Number hours of parenting program self-study training (GCS): Still working to develop broader program implementation and effective/consistent reporting practices.

Output 4 - Number of marriage education trainings held: Still working to develop broader program implementation and effective/consistent reporting practices.

Output 5 - Number of participants in marriage training: Over-targeted number of course participants.

Output 6 - Number of organized 4-H clubs: Over-targeted increase in number of

clubs.

Output 7 - Number non-duplicated participants in 4-H Youth Healthy Lifestyles Programs: Disparity in reporting procedures; need to revise types of data gathered.

Output 9 - Number of Best Care trainings: Over-targeted number of trainings that would be held

Output 16 - Number of babysitting course participants: Over-targeted number of course participants.

Output 18 - Number of participants completing Best Care: Over-targeted number of course participants.

Output 24 - Number of Parenting Journey maps circulated: Over-targeted number of circulated maps.

Outcome 1 - Number of 4-H participants who learned accepting differences life skill: Over-targeted anticipated number of youth affected by programs.

Outcome 2 - Number of 4-H participants who learned healthy lifestyles choices life skill: Over-targeted anticipated number of youth affected by programs and disparity in reporting procedures; need to revise types of data gathered.

Outcome 3 - Number of 4-H participants who learned self-responsibility life skill: Over-targeted anticipated number of youth affected by programs.

Outcome 4 - Number of 4-H participants who learned leadership life skill: Over-targeted anticipated number of youth affected by programs and disparity in reporting procedures; need to revise types of data gathered.

Outcome 5 - Number of 4-H participants who learned marketable skills life skill: Over-targeted anticipated number of youth affected by programs and disparity in reporting procedures; need to revise types of data gathered.

Outcome 6 - Number of 4-H participants who learned wise use of resources life skill: Over-targeted anticipated number of youth affected by programs.

Outcome 9 - Number of participants adopting parenting behavior: Over-targeted number of participants. Still working to develop broader program implementation and effective/consistent reporting practices.

Outcome 10 - Number of participants adopting relationship-enhancing behavior: Over-targeted number of participants. Still working to develop broader program implementation and effective/consistent reporting practices.

Outcome 18 - Number of participants gaining knowledge about relationship-enhancing behavior: Over-targeted number of participants. Still working to develop broader program implementation and effective/consistent reporting practices.

Outcome 19 - Number of participants gaining knowledge about personal development behavior: Over-targeted number of participants. Still working to develop broader program implementation and effective/consistent reporting practices.

Outcome 23 - Number of participants gaining knowledge about babysitting practices: Over-targeted number of participants.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)

- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

In 2010, 4,008 Arkansas child care professionals participated in our training programs and successfully completed 27,017 hours of training. With an estimated value of \$15 per training hour, our child care professional training programs saved Arkansas child care professionals \$405,255 in training costs in 2010.

Evaluation results for 2010 indicate that 96% (3,835) of child care professionals trained *strongly agreed* or *agreed* that their knowledge of effective child care practices had increased as a result of our trainings. Eighty percent (3,061) of participants *strongly agreed* or *agreed* they would do one or more new things to be a better child care professional as a result of our trainings.

In addition, analysis from paired samples T-tests revealed that both Best Care and Best Care Connected participants in 2010 had statistically significant increases ($p < .001$) in their levels of understanding of each of the lesson topics from Time 1 (before participation in our training) to Time 2 (after participating in our training).

Key Items of Evaluation

- * Knowledge of effective child care practices.
- * Behavior change to be a better child care professional.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Agricultural and Food Biosecurity (Reported In Other Programs)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
212	Pathogens and Nematodes Affecting Plants	100%		100%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	2.6	0.0	3.2	0.0
Actual	0.0	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Data previously reported to Agricultural and Food Biosecurity, for FY2010, is reported to Global Food Security and Hunger.

2. Brief description of the target audience

Data previously reported to Agricultural and Food Biosecurity, for FY2010, is reported to Global Food Security and Hunger.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	10500	20500	120	0
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 3
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	5	20	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of clientele trained on Agricultural and Food Biosecurity

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10500	0

Output #2

Output Measure

- # of educational materials developed on Agricultural and Food Biosecurity

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10	0

Output #3

Output Measure

- # of Agricultural and Food Biosecurity assessments completed.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10	0

Output #4

Output Measure

- # of requested consultations related to exotic animal disease concerns

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	150	0

Output #5

Output Measure

- # of hits to CES website regarding avian biosecurity

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	13800	0

Output #6

Output Measure

- # of hits to CES website regarding livestock biosecurity

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	20700	0

Output #7

Output Measure

- # of plant sites surveyed or monitored

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	35	0

Output #8

Output Measure

- # of farm visits or one-on-one consultations with clientele related to Biosecurity.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	100	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	# of growers/producers reporting knowledge gained about the need for biosecurity
2	# of growers/producers reporting intent to adopt new biosecurity practices for animal production facilities
3	# of growers/producers adopting new practices outlined in educational programs to improve biosecurity through proper methods of sanitation, disease prevention, recognition, and control
4	# of diagnostic plant pest samples submitted
5	# of diagnostic nematode samples submitted
6	# of avian samples submitted to diagnostic labs for exotic animal surveillance disease testing (LT/MG/MS)
7	# of Asian Soybean Rust positive samples
8	# of livestock samples submitted to diagnostic labs for exotic animal diseases testing

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

Not Reporting on this Outcome Measure

of growers/producers reporting knowledge gained about the need for biosecurity

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	150	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This data will be reported in the Global Food Security and Hunger program area.

What has been done

Results

4. Associated Knowledge Areas

Outcome #2

1. Outcome Measures

Not Reporting on this Outcome Measure

of growers/producers reporting intent to adopt new biosecurity practices for animal production facilities

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	150	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This data will be reported in the Global Food Security and Hunger program area.

What has been done

Results

4. Associated Knowledge Areas

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure

of growers/producers adopting new practices outlined in educational programs to improve biosecurity through proper methods of sanitation, disease prevention, recognition, and control

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This data will be reported in the Global Food Security and Hunger program area.

What has been done

Results

4. Associated Knowledge Areas

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure
of diagnostic plant pest samples submitted

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This data will be reported in the Global Food Security and Hunger program area.

What has been done

Results

4. Associated Knowledge Areas

Outcome #5

1. Outcome Measures

Not Reporting on this Outcome Measure

of diagnostic nematode samples submitted

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	5000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This data will be reported in the Global Food Security and Hunger program area.

What has been done

Results

4. Associated Knowledge Areas

Outcome #6

1. Outcome Measures

Not Reporting on this Outcome Measure

of avian samples submitted to diagnostic labs for exotic animal surveillance disease testing (LT/MG/MS)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	18000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This data will be reported in the Global Food Security and Hunger program area.

What has been done

Results

4. Associated Knowledge Areas

Outcome #7

1. Outcome Measures

- Not Reporting on this Outcome Measure
- # of Asian Soybean Rust positive samples

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	200	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This data will be reported in the Global Food Security and Hunger program area.

What has been done

Results

4. Associated Knowledge Areas

Outcome #8

1. Outcome Measures

- Not Reporting on this Outcome Measure

of livestock samples submitted to diagnostic labs for exotic animal diseases testing

2. Associated Institution Types

- 1862 Extension
 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
 Change in Action Outcome Measure
 Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This outcome was not reported.

What has been done

Results

4. Associated Knowledge Areas

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Data previously reported to Agricultural and Food Biosecurity, for FY2010, is reported to Global Food Security and Hunger.)

Brief Explanation

Data previously reported to Agricultural and Food Biosecurity, for FY2010, is reported to Global Food Security and Hunger.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

Data previously reported to Agricultural and Food Biosecurity, for FY2010, is reported to Global Food Security and Hunger.

Key Items of Evaluation

Data previously reported to Agricultural and Food Biosecurity, for FY2010, is reported to Global Food Security and Hunger.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Agricultural Systems

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships				
112	Watershed Protection and Management				
131	Alternative Uses of Land				
133	Pollution Prevention and Mitigation				
134	Outdoor Recreation				
204	Plant Product Quality and Utility (Preharvest)				
205	Plant Management Systems				
216	Integrated Pest Management Systems				
307	Animal Management Systems				
401	Structures, Facilities, and General Purpose Farm Supplies				
403	Waste Disposal, Recycling, and Reuse				
601	Economics of Agricultural Production and Farm Management				
602	Business Management, Finance, and Taxation				
604	Marketing and Distribution Practices				
605	Natural Resource and Environmental Economics				
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources				
	Total				

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890

Plan	6.0	0.0	1.8	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

Data previously reported to Agricultural Systems will be reported to Global Food Security, Economics & Commerce, and Natural Resources & Environment respectively.

2. Brief description of the target audience

Data previously reported to Agricultural Systems will be reported to Global Food Security, Economics & Commerce, and Natural Resources & Environment respectively.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	7100	10000	150	200
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	1	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # attending Agricultural Systems education classes, workshops, group discussions, one-on-one interventions, and other educational methods

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	7100	0

Output #2

Output Measure

- # Of Agricultural Systems education classes, workshops, group discussions, and other educational events

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	65	0

Output #3

Output Measure

- Number of demonstrations (for example demonstration study farm, food plots, etc.)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	20	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	# of clientele who reported knowledge gained
2	Value of alternative agricultural products sold (\$1000)
3	Acres of alternative crops planted.
4	# of clientele who initiated an alternative enterprise, as self reported
5	# of farms selling alternative agricultural products or services in various methods, such as farmer markets and wildlife enterprises
6	# clientele who used program information to decide NOT to initiate an alternative enterprise, as self-reported

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

- Not Reporting on this Outcome Measure
of clientele who reported knowledge gained

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	250	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Data previously reported to Agricultural Systems will be reported to Global Food Security, Economics & Commerce, and Natural Resources & Environment respectively.

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 134 - Outdoor Recreation
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 307 - Animal Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies

- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from

Outcome #2

1. Outcome Measures

- Not Reporting on this Outcome Measure
Value of alternative agricultural products sold (\$1000)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	20000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 134 - Outdoor Recreation
- 204 - Plant Product Quality and Utility (Preharvest)

- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 307 - Animal Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure

Acres of alternative crops planted.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Data previously reported to Agricultural Systems will be reported to Global Food Security, Economics & Commerce, and Natural Resources & Environment respectively.

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 134 - Outdoor Recreation
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 307 - Animal Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure
- # of clientele who initiated an alternative enterprise, as self reported

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	25	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Data previously reported to Agricultural Systems will be reported to Global Food Security, Economics & Commerce, and Natural Resources & Environment respectively.

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 134 - Outdoor Recreation
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 307 - Animal Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from

Outcome #5

1. Outcome Measures

- Not Reporting on this Outcome Measure

of farms selling alternative agricultural products or services in various methods, such as farmer markets and wildlife enterprises

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	250	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Reported in Economic & Commerce

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 134 - Outdoor Recreation
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 307 - Animal Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from

Outcome #6

1. Outcome Measures

- Not Reporting on this Outcome Measure

clientele who used program information to decide NOT to initiate an alternative enterprise, as self-reported

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	25	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Reported in Economic & Commerce

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 134 - Outdoor Recreation
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 307 - Animal Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 403 - Waste Disposal, Recycling, and Reuse
- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Data previously reported to Agricultural Systems will be reported to Global Food Security, Economics & Commerce, and Natural Resources & Environment respectively.)

Brief Explanation

Data previously reported to Agricultural Systems will be reported to Global Food Security, Economics & Commerce, and Natural Resources & Environment respectively.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

Data previously reported to Agricultural Systems will be reported to Global Food Security, Economics & Commerce, and Natural Resources & Environment respectively.

Key Items of Evaluation

Data previously reported to Agricultural Systems will be reported to Global Food Security, Economics & Commerce, and Natural Resources & Environment respectively.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Animals & Animal Products

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants				
204	Plant Product Quality and Utility (Preharvest)				
205	Plant Management Systems				
206	Basic Plant Biology				
301	Reproductive Performance of Animals				
302	Nutrient Utilization in Animals				
303	Genetic Improvement of Animals				
304	Animal Genome				
305	Animal Physiological Processes				
306	Environmental Stress in Animals				
307	Animal Management Systems				
308	Improved Animal Products (Before Harvest)				
311	Animal Diseases				
315	Animal Welfare/Well-Being and Protection				
601	Economics of Agricultural Production and Farm Management				
	Total				

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	21.6	0.0	20.4	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

Data previously reported to Animal & Animal Products will be reported to Global Food Security and Hunger.

2. Brief description of the target audience

Data previously reported to Animal & Animal Products will be reported to Global Food Security and Hunger.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	39000	44000	2243	2700
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 4
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	13	128	

Actual	0	0	0
---------------	---	---	---

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs, workshops, educational meeting and/or field days

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	6800	0

Output #2

Output Measure

- Number of clientele attending educational programs (field days, workshops, etc.)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	38000	0

Output #3

Output Measure

- Number of producers receiving educational material (newsletters, fact sheets, etc)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	45000	0

Output #4

Output Measure

- Number of producers conducting on farm demonstrations

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	25	0

Output #5

Output Measure

- Number of farm visits or one-on-one consultations with producers

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	5000	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of livestock producers who increased knowledge related to livestock production management practices
2	Number of livestock producers who adopted a new practice
3	Number of livestock producers who initiated or improved their record keeping
4	Number of poultry producers who adopted new practices or technology
5	Number of allied poultry industry personnel who adopt new practices or technology
6	Number of livestock producers who changed an existing management practice
7	Number of clientele who reported knowledge gained related to aquaculture.
8	Number of clientele who adopted new aquaculture practices.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of livestock producers who increased knowledge related to livestock production management practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems

- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 315 - Animal Welfare/Well-Being and Protection
- 601 - Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of livestock producers who adopted a new practice

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3600	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome

- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 315 - Animal Welfare/Well-Being and Protection
- 601 - Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of livestock producers who initiated or improved their record keeping

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	70	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 301 - Reproductive Performance of Animals

- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 315 - Animal Welfare/Well-Being and Protection
- 601 - Economics of Agricultural Production and Farm Management

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of poultry producers who adopted new practices or technology

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)

- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 315 - Animal Welfare/Well-Being and Protection
- 601 - Economics of Agricultural Production and Farm Management

Outcome #5

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of allied poultry industry personnel who adopt new practices or technology

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	30	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 315 - Animal Welfare/Well-Being and Protection
- 601 - Economics of Agricultural Production and Farm Management

Outcome #6

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of livestock producers who changed an existing management practice

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	750	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 315 - Animal Welfare/Well-Being and Protection
- 601 - Economics of Agricultural Production and Farm Management

Outcome #7

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of clientele who reported knowledge gained related to aquaculture.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	60	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 315 - Animal Welfare/Well-Being and Protection
- 601 - Economics of Agricultural Production and Farm Management

Outcome #8

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of clientele who adopted new aquaculture practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
-------------	----------------------------	---------------

2010

109

0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 304 - Animal Genome
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 315 - Animal Welfare/Well-Being and Protection
- 601 - Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Data previously reported to Animal & Animal Products will be reported to Global Food Security and Hunger.)

Brief Explanation

Data previously reported to Animal & Animal Products will be reported to Global Food Security and Hunger.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

Data previously reported to Animal & Animal Products will be reported to Global Food Security and Hunger.

Key Items of Evaluation

Data previously reported to Animal & Animal Products will be reported to Global Food Security and Hunger.

V(A). Planned Program (Summary)

Program # 5

1. Name of the Planned Program

Economics & Commerce

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management	25%		35%	
602	Business Management, Finance, and Taxation	12%		19%	
603	Market Economics	5%		8%	
604	Marketing and Distribution Practices	6%		6%	
605	Natural Resource and Environmental Economics	1%		9%	
606	International Trade and Development	2%		4%	
608	Community Resource Planning and Development	18%		5%	
609	Economic Theory and Methods	1%		2%	
610	Domestic Policy Analysis	15%		10%	
611	Foreign Policy and Programs	1%		2%	
801	Individual and Family Resource Management	7%		0%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	5%		0%	
805	Community Institutions, Health, and Social Services	2%		0%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	30.1	0.0	8.4	0.0
Actual	26.0	0.0	5.8	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
325393	0	314272	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
431812	0	318700	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2945626	0	1220094	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct research and facilitate the development and adoption of new technologies, products and strategies that will enhance global competitiveness
- Conduct economic and policy research and evaluations that may increase economic efficiencies and improve socioeconomic conditions
- Create and distribute educational products and materials using print and electronic mediums
- Develop and conduct educational meetings
- Provide professional services to clientele
- Develop, evaluate, and disseminate education programs and curricula, incorporating new research
- Develop county and economic profiles for educational purposes
- Convene issue forums for both internal and external audiences

2. Brief description of the target audience

- Producers - Small, large, limited resource, retirement, other
- Businesses - Industry, small, large, rural, urban, consultants, other
- Consumers - Limited resource, families, retired, youth, middle age, other
- Elected Officials - city, county, state, and national
- Organizations - Civic, community, producer, consumer, nonprofit and other
- Government Personnel - Public agencies and administrators, and other
- Voters
- Research, Extension and teaching professionals
- Other

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	16000	104300	1500	400
Actual	31187	119822	1404	891

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	15	20	
Actual	39	22	61

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational products and materials developed or updated for print, electronic media, radio, podcasts, or display.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	320	522

Output #2

Output Measure

- Number of scientific publications.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	20	22

Output #3

Output Measure

- Number of graduate students completing degrees.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	14	18

Output #4

Output Measure

- Number of educational activities conducted related to economics and commerce.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	100	344

Output #5

Output Measure

- Number of clientele attending educational activities related to economics and commerce.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1500	31024

Output #6

Output Measure

- Number of participants in individual and family resource management programs.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	500	2341

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants who increase knowledge of economics and commerce.
2	Number of participants who indicate a change in behavior based on what they've learned about economics and commerce
3	Sustainable, vibrant and globally competitive agricultural sector for Arkansas as indicated by Arkansas Cash Farm Receipts (in thousand dollars) (NASS)
4	Sustainable, vibrant and globally competitive agricultural sector for Arkansas as indicated by Arkansas Net Farm Incomes (in thousand dollars) (ERS)
5	Number of jobs created or retained through educational programs
6	Dollars of revenue generated by businesses as a result of educational programs
7	Number of participants who increase their knowledge of individual and family resource management.
8	Economic Feasibility of On-Farm Grain Storage (Quantitative measure included in Outcome #1)
9	Producers Gained Knowledge of Commodity Marketing Skills in a Variety of Farm Business Situations (Quantitative measure included in Outcome #1)
10	Evaluation of the COTMAN Program (Quantitative measure included in Outcome #1)
11	Assessment of Preparedness for Agricultural Bioterrorism in Arkansas (Quantitative measure included in Outcome #1)

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of participants who increase knowledge of economics and commerce.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	34673	42727

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Since the late 1980s, the Ozarks Plateau region has experienced rapid growth in poultry and livestock production and population growth in the area. This resulted in excess nutrient production from both agricultural sources and municipal bio-solids. Increased phosphorus in runoff water into surface sources has often been attributed to these phenomena. Effective and economically efficient movement of excess nutrients is a reasonable and sustainable method for moving these nutrients into areas of high agricultural productivity by providing a soil amendment from a non-chemical source.

What has been done

Poultry litter and dewatered municipal bio-solids were blended, compacted and wrapped in a gas semi-permeable plastic to test nutrient preservation and pathogen destruction capabilities of the baling system on the co-processed product (PL/DMB). The PL/DMB was seeded with 500,000 colony-forming units per gram of a non-pathogenic E. coli routinely used as an indicator to confirm reliability of food processing procedures. Extensive testing revealed low nitrogen loss from volatilization and elimination of E. coli indicators within 90 hours. The USEPA accepted the project report; verification as an approved method is on-going.

Results

Numerous leading farmers in the Arkansas Delta experienced encouraging results from use of the baled poultry litter system developed by the Division of Agriculture, now commercialized by White River Fertilizers. In actual farm use by prominent Arkansas farmers, application of one ton per acre produced a 32% yield increase in average yield this year on 500 acres of cotton, using supplemental N to meet soil requirements. This farm will increase use to 3000 acres. A rice farm

used 2 tons per acre on severely cut rice ground and obtained yields of 178 bushels per acre, 55% greater than expected; he will use litter for his third. Numerous others have experienced similar results on other crops. Dr. M. Mozaffari will undertake the third year of testing of baled, co-processed product (PL/DMB) this year; results to date indicate a soil enrichment program incorporating PL/DMB rather than total reliance on chemical fertilizers results in increased profitability. The Northwest Arkansas Conservancy Authority is considering adopting the PL/DMB system at their regional sewage treatment plant near Centerton. Successful implementation of the system at that site could allow in excess of 200,000 tons of PL/DMB to be moved from the nutrient-excess NWA region to nutrient-deficit row crop production areas in Eastern Arkansas and surrounding states.

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

Outcome #2

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants who indicate a change in behavior based on what they've learned about economics and commerce

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3000	8140

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Traditional manufacturing industries are not likely to locate in rural Arkansas communities, especially in distressed areas. Yet, most rural communities continue to depend on industrial recruitment as an economic development rather than exploring alternative economic development strategies. Most community and local business leaders are not taking advantage of local assets for community development and are not creating economic development efforts that area sustainable over the long run.

What has been done

Community and Economic Development (CED) has provided educational programming and technical assistance to help communities build local capacity for asset based social and economic improvements. CED faculty and extension educators have provided statewide and county level conferences, workshops, seminars and community planning sessions for building viable and sustainable communities. They have worked with communities in identifying assets for local economic development, developing and implementing strategic plans, and identifying and implementing opportunities for economic diversification. CED faculty have also engaged in applied research and evaluation, collecting data on community conditions and the effectiveness of intervention strategies through both quantitative (secondary data) and qualitative methodologies (primarily focus groups and roundtables)

Results

Participants in CED programs are taking charge of how they live and work. They have developed and implemented strategic plans for improving economic conditions and quality of life in their communities. They have created new economic opportunities by tackling new and innovative community based projects designed to bring more dollars into their communities (such as historical, natural resource based, cultural and agritourism). They have developed significant numbers of new jobs opportunities by developing new value-added and direct marketing ventures (farmers markets, fruits and horticultural enterprises). Some have taken advantage of new technologies to bring broadband into their communities and others have used broadband to create new e-commerce businesses. They have also improved the quality of their lives, providing new housing, maintaining services and improving local infrastructure. In some persistent poverty communities, we are beginning to see an increase in income and a decline in the poverty rate.

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development

- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure

Sustainable, vibrant and globally competitive agricultural sector for Arkansas as indicated by Arkansas Cash Farm Receipts (in thousand dollars) (NASS)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	7655760	7190057

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is growing public interest in reducing green house gas (GHA) emissions. A small and relatively unused carbon market has functioned in the U.S. for a few years. If any of the bills being discussed in Congress were to pass, the value of carbon is projected to increase from \$.10 per ton to \$30-\$40 per ton. Because agriculture is one of the few ways to naturally sequester carbon and each crop sequesters a different amount of carbon, a high value for carbon sequestration could change economic incentives for various crops and have major implications for cropping patterns. Little research has been conducted on how various carbon prices would affect producer revenue and cropping patterns in the US and the literature is nearly void in Arkansas.

What has been done

A model was developed to quantify the amount of carbon each of the largest eight crops in Arkansas could sequester in each of its 75 counties. The model took into account the soil portfolio in each county, the tillage practices, and harvest indices for each crop in each county. From this an estimate of sequestered carbon per acre per crop per county could be obtained.

Results

The model itself set forth a new methodology for measuring carbon emissions as well as providing policymakers the implications of carbon offset market. The models estimates have been used by commodity groups (Cotton Incorporated) to assess how a carbon offset market would affect cotton producers. The estimates also provide policy makers a snapshot of how various carbon prices will affect cropping patterns and resulting input and output prices.

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure

Sustainable, vibrant and globally competitive agricultural sector for Arkansas as indicated by Arkansas Net Farm Incomes (in thousand dollars) (ERS)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2517163	1821742

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Economic events in the fiscal reporting year were fluid and dynamic. By September 20, 2010 the recession that began in December 2007 was officially identified as having ended. The recession lasted 18 months, which makes it the longest of any recession since World War II.

The difference in this recession was it resulted from a financial crisis due in large part to the U.S. and European's almost indescribable debt burden. Though the recession has passed, the financial crisis continues. Historically, recoveries after financial crises are normally weak and slow as banking systems, etc. repair and rebuilt balance sheets. The historical recovery period from a financial crisis generally will last seven-plus years, so research and educational challenges remain.

In 2009/2010 two major economic concerns of University of Arkansas Division of Agriculture clientele were: First, the recession's economic impact on their farm or business, state and local government or community and families; and Second, the financial crisis' status and/or duration and economic impact to their farm or business, state and local government or community and families.

Farmers, businesses, financial institutions, and families were concerned about their profitability or financial well being and longer term economic challenges. Local and state governments were seeking answers to an array of questions on the economic situation and outlook.

What has been done

In addressing our clientele's concerns we enhanced our ongoing economic, market, and agricultural outlook and our policy research and educational efforts to provide an enhanced understanding of the economic and policy realities caused by the ongoing financial crisis. This information was then brought together to give our clientele a big picture perspective of the economy, markets, and agricultural outlook. This allowed us in real-time to speak to a broad set of issues impacting producers and businessmen, state and local governments and families. We spoke one-on-one, at group, producer, and state meetings. To provide the most current economic, market, and agricultural outlook information to a broader array of clientele we enhanced our web and social delivery of economic, market, and agricultural outlook and policy information.

Results

We were and are today able to provide our clientele in real time with insight, perspective and considerations about the economic and monetary setting, markets, and agricultural outlook. We achieved these results at the national, state, local, and producer levels. Our economic, market, and agricultural outlook and policy web delivery traffic averaged over 10,000 hits per month.

An example of the economic concerns at the national and global level came from a major multinational cereal company, a major buyer and processor of Arkansas and U.S. rice. To address their concerns we spoke at their in-house technical symposium on how the U.S. and global economic setting was and may impact global and rice situation and outlook. Today, we continue to pass along information, data, and our perspective to this organization and our clientele.

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

Outcome #5

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of jobs created or retained through educational programs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2250	2726

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Manufacturing is vital to the Arkansas economy and is an important source of off-farm income to farm families. More than a third of the counties in Arkansas depend on manufacturing employment. However, manufacturing, especially non-durable manufacturing, continues to downsize and relocate to those areas where the costs of production are lower. In those communities suffering from the loss of jobs and economic opportunities, populations, incomes and quality of life are declining. These changes create greater fiscal stress for local governments

and these communities are becoming more vulnerable to both economic and natural disasters.

What has been done

In an effort to help rural communities adjust to these changes in how they work and live, University of Arkansas Community and Economic Development (CED) programs have focused on building local capacity for social and economic improvement. CED has provided educational outreach and technical assistance to Arkansans to help them understand how to create new economic opportunities and build community resiliency to social and economic hardships. CED faculty and extension educators have provided statewide and county level conferences, workshops, seminars and community planning sessions. They have also engaged in applied research and evaluation, collecting data on community conditions and the effectiveness of intervention strategies through both quantitative (secondary data) and qualitative methodologies (primarily focus groups and roundtables). CED faculty and extension educators throughout the state are also working with local government leaders to help them understand their current fiscal situations and to identify cost-effective ways to continue to provide infrastructure and services given their fiscal constraints.

Results

Participants in CED programs have learned to a) build their local capacity for improving social and economic conditions, b) work together to create specific changes in their communities, c) implement diverse economic development strategies (such as helping small and niche market agricultural producers with new markets, creating opportunities for new and/or efficient businesses through broadband, and the promotion of tourism) d) maintain or improve the local quality of life.

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

Outcome #6

1. Outcome Measures

Not Reporting on this Outcome Measure

Dollars of revenue generated by businesses as a result of educational programs

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	75000000	90429528

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agriculture has been a primary stimulus of economic growth in Arkansas since statehood. While agriculture contributes to the economy through direct agricultural production and value-added processing, it also plays an important role through its interactions with other sectors. The use of non-agricultural goods and services as inputs into the agriculture sector promotes diversified growth in the economy, thereby allowing agriculture to remain a vital part of the state economy.

What has been done

The total economic impact (direct, indirect and induced effects) of agriculture (production and processing for crop, animal agriculture and forestry) on value added, employment and wage income was estimated for the latest year data are available for extensive analysis, 2008. Agriculture is responsible for the creation of 261,101 jobs, or 16.6% the state's jobs, \$9.6B or 15.6% of the state labor income and \$16.3B or 17.0% of the state's value added. While agriculture generates value added, employment and wages in all of the study sectors, roughly 48% of agriculture's contribution occurs in industries outside of agriculture such as Wholesale Trade, Real Estate and Rental, and Transportation and Warehousing. Individually, the crop, animal agriculture and forestry sectors provide the catalyst for the direct creation of \$3.3B, \$2.6B and \$2.6B, respectively, in value added and 56,051 crop sector jobs, 57,601 animal agriculture sector jobs and 34,065 forest sector jobs.

Results

The total impact of agriculture on the Arkansas economy has remained relatively constant in the past several years despite depressed agricultural commodity prices and market imbalances in supply and demand. Arkansas remains more dependent upon agriculture for its Gross Domestic

Product by State than do its neighbors in the Southeast. The vital importance of agriculture to Arkansas' economy, particularly rural areas of the state with limited alternatives for economic activity and growth is highlighted by the significant economic activity generated in associated industrial and human service sectors as a result of the indirect and induced impacts of agriculture. Research results of this project are highlighted to assist governmental and business personnel and policymakers in deciding upon and pursuing appropriate and positive courses of action that directly and indirectly affect the agricultural and rural communities of Arkansas.

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

Outcome #7

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants who increase their knowledge of individual and family resource management.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	300	2031

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Family Focus:

As in many states across the nation, Arkansas families are struggling to adjust to tough economic times. Individuals and families aspire to remain financially secure while facing economic downturn, poverty, and job loss. Food and fuel prices are rising faster than consumer price index. The consumer price index for all items minus food and energy rose 0.8% over the year while the food index rose 1.4%. USDA is predicting overall food inflation to be 2-3% next year. Fresh vegetable prices are up 4.4% from last year. Prices of many staples have risen sharply in recent months. Many Arkansas families already live in food insecure households.

Young Adult Focus:

According to the most recent national Jump\$tart survey of high school seniors, the financial literacy of high school students has fallen to its lowest level ever (2008). Arkansas students scored just below the national average with an overall score of 47. Financial education is especially critical for Arkansas youth because of high poverty rates across the state. Poverty rates have increased since 2005 with pockets of extreme poverty throughout the state.

According to the Survey of Consumer Payment Choice by the Federal Reserve Bank of Boston (January 2010), the average age a U.S. consumer gets their first credit card is 20.8. Another survey, How Undergraduate Students Use Credit Cards, by Sallie Mae (April, 2009) reported that 84% of American undergraduate students have a credit card, with half having four or more credit cards. Since 2004, students who arrived on college campuses as freshmen with a credit card already in hand have increased from 23% to 39%. According to "Generation Broke: Growth of Debt Among Young Americans," young adults ages 18-24 now have the second highest rate of bankruptcy in the country.

In a survey of young adults ages 23-28 (Charles Schwab 2009 Young Adults & Money Survey), 71% indicated that they are very concerned about the country's economic future. On average, they have more than \$14,000 in debt, carry a credit card balance, and don't save for the future. More than 40% of the young adults surveyed, stated that they wish they had been taught more about budgeting and saving before they entered the workforce. Looking at a younger group, a survey of teens found that many don't know how to budget, don't understand saving, and are unsure about how to invest.

What has been done

Family Focus:

One way that families can respond is by adjusting flexible expenses. While some expenses, such as mortgage and car payment, are set. Other spending categories such as food are more flexible. With the right strategies, families can maximize the use of their food dollars. Cooperative Extension Service educational efforts provided Arkansas consumers with money management knowledge and skills that are critical to maintaining financial security.

Young Adult Focus:

The Cooperative Extension Service targeted personal financial education programs to meet the needs of today's young adults. The Arkansas Service Commission contacted the Cooperative Extension Service to provide training for AmeriCorps program graduates in several locations across the state. Multi-county AmeriCorps training events were held in Monticello (2 days), Little Rock (1 day), and Springdale (1 day). Materials developed included lesson guide, script, power point, activities, handouts, and evaluation tool. 264 young adults attended the sessions and

reported intended behavior change including setting financial goals (58%), creating and using a spending plan (69%), and checking credit reports (70%).

Results

Family Focus:

More than 2000 individuals indicated that they increased their knowledge of personal financial management practices. Nearly 800 program participants reported making at least one positive change in their money management practices. Specific educational efforts focused on helping consumers to make the most of their household food budgets. Participants were instructed about smart shopping practices including using coupons to save money. Evaluations revealed that 279 consumers saved \$32,603 over a period of 15 weeks or less. One participant said "This was an easy way to stretch my food dollars and required very little work or effort. I saved over \$467 which is huge since I am newly retired." Another said "I was able to save over \$1,186 for things I was going to buy anyway! Thank you!"

Young Adult Focus:

Other programs were designed to target older youth and young adults. The College Student Budget was presented to 292 students on two different campuses. Participants reported being more likely to make a spending plan (61%) and more likely to stick to a budget (87%). More than 100 special needs high school seniors participated in an educational program on money management as part of a multi-county Transition Fair. High school students across the state participated in personal finance simulations in 11 counties with 996 participants. Students increased understanding about credit (82%) and budgeting (77%).

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

Outcome #8

1. Outcome Measures

- Not Reporting on this Outcome Measure

Economic Feasibility of On-Farm Grain Storage (Quantitative measure included in Outcome #1)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The interest in grain storage in Arkansas and other states has escalated in recent years. While Arkansas has historically relied heavily on off-farm (commercial) storage, a number of factors have led to increases in the amount of on-farm storage. In addition to the increasing demand for U.S. corn and soybeans, some additional reasons for the interest in on-farm storage are (1) increasing acreage of specialty crops and the need to preserve the identity of crops; (2) farmers changing their crop mixes due to production flexibility; (3) producers using larger trucks, making it easier for them to haul grain directly to its final destination, thereby bypassing local grain elevators; (4) harvest time bottleneck concerns; (5) commercial grain drying costs; and (6) basis and futures price volatility.

What has been done

Agricultural Economics and Agribusiness (AEAB) in cooperation with Biological and Agricultural Engineering (BAE) plays a vital role in helping producers assess the cost of on-farm storage. Grain storage costs have both fixed and variable components. To assist producers in making on-farm storage investment decisions, team members from AEAB and BAE designed a user-friendly spreadsheet model that provides estimates as to what grain storage facility costs might be based on a number of design variables. This decision aid is now available on the University of Arkansas Cooperative Extension Service website.

Results

On-farm storage capacities around the state range from approximately 9,000 to 200,000 bushels with total investments ranging from \$30,000 to in excess of \$600,000. The choice of storage options depends on the relative cost of each one and how it fits into the producer's overall harvesting, handling and marketing system. First, bin costs vary widely, depending on options and types of equipment. Construction site preparation can also affect total investment. Therefore an individualized and unique analysis must be prepared for each storage facility. Given the average size investment of these facilities it is crucial for the investor to obtain a preliminary assessment of the feasibility of on-farm storage.

Storing grain beyond harvest greatly increases the producer's marketing opportunities, flexibility, and possibly net selling price. From a producer's perspective, commercial storage costs are characterized as being variable cost only. Statewide commercial grain storage costs range from 5¢ to 10¢ per bushel per month. In addition, commercial grain drying costs for Arkansas

producers can be \$30 to \$70 per acre depending upon crop, yield, and grain moisture content. Given the significance of commercial grain storage and drying costs, Arkansas' producers certainly have a financial incentive to assess the costs and benefits to their operation that may be accrued from on-farm storage facilities.

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

Outcome #9

1. Outcome Measures

- Not Reporting on this Outcome Measure

Producers Gained Knowledge of Commodity Marketing Skills in a Variety of Farm Business Situations (Quantitative measure included in Outcome #1)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Arkansas producers find themselves today in a turbulent marketing environment that includes both a worldwide perspective and greater speculation in agricultural commodities. Extreme commodity and input price volatility requires producers to have a better understanding of budgeting and commodity marketing for the purpose of managing price risk.

What has been done

Row crop and livestock producers throughout Arkansas can benefit from educational programs that address commodity marketing concerns. Short courses and seminars are available to agricultural producers, agricultural lenders, and other interested parties. The curriculum consists of: cash marketing, marketing plans, technical analysis, futures and options, market outlook, and other marketing related skills such as identifying production costs and determining break-even prices. The intent of these courses and seminars is to provide participants with both knowledge and skills to apply in a variety of farm business situations.

County extension offices and agricultural lenders are increasingly offering this type of educational programming in a traditional classroom setting or through small group meetings such as local marketing clubs to help increase grower knowledge of price risk management. In addition, assistance is also offered through individualized instruction. Instructors are frequently in contact with clientele to review and evaluate progress on course content.

Results

For many, futures and options can be complicated and mastery of this subject matter can take years. Program participants in four (4) counties were introduced to and practiced using a variety of pricing tools to develop knowledge and confidence. Generally, each workshop was designed as a three-hour program, with an in-depth review of pricing tools, ranging from a basic forward contract to options strategies that establish minimum and maximum prices.

Following these courses and seminars, some participants extended their knowledge to other producers by providing leadership for marketing clubs. Local marketing clubs have created additional opportunities for extension staff to communicate marketing skills to a broader audience of producers. Clientele participants receive financial benefit from their education as well as other skills. Many producers report the adoption of a written marketing plan and greater confidence and willingness to use a variety of marketing tools.

County extension agents have received positive feedback through evaluations and are pleased with the participation in these workshops. Additional county offices will offer educational seminars and workshops in 2011 to help increase grower and agricultural lender knowledge of risk management using commodity futures, options, and other cash marketing instruments.

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods

- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

Outcome #10

1. Outcome Measures

- Not Reporting on this Outcome Measure

Evaluation of the COTMAN Program (Quantitative measure included in Outcome #1)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

COTMAN is an in-season cotton crop information and monitoring system used to track physiological development and crop maturity to provide guidance on optimal timing of insecticide and defoliation applications, to improve economic returns and environmental sustainability. It has been available as PC software since 1994, designed for use by producers, consultants and researchers. A need has arisen to assess the strengths and weaknesses of COTMAN from the user's perspective--to identify barriers and incentives for adoption, assess usability, identify educational and support needs, and to direct efforts for future software development and delivery.

What has been done

A study using two focus groups--consultant COTMAN users and consultant COTMAN non-users was conducted in January 2010. Both groups (six participants per group) were asked to respond to open ended questions framed to introduce the topics of 1) barriers and incentives to adoption, 2) software usability enhancements, 3) education and support needs and 4) future software/hardware development directions. Consultants were characterized by geographic location, years of experience, number of clientele, clientele acreage and years of experience with COTMAN. Qualitative responses to the following questions were summarized and compared

between groups. What are incentives to use COTMAN? What are barriers to using COTMAN? What are useful production management software functions? Is COTMAN missing important functions or features? Does COTMAN have features not needed? What aspect of COTMAN needs most improvement? What is the best way to support COTMAN or production management software? Are software tools other than COTMAN used? How likely are you to use COTMAN in the future?

Results

While the focus group study results cannot be used as estimates of a population response, they do provide invaluable information on the scope of problems and prospects for enhancing the development and usefulness of COTMAN. The responses indicated that improvements are needed to expand adoption and use of COTMAN. Enhancements to data collection, hardware, weather tracking, and reporting of results are needed. More training and field level support are needed. With improvements all respondents indicated that they would be interested in potentially using COTMAN. Enhancing COTMAN will result in better informed decision-making and management of cotton production in the United States. Improved efficiency in use of costly insecticides and defoliant will reduce costs of production, increase yields and result in higher profitability for cotton producers, making U.S. cotton more competitive in domestic and global markets.

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

Outcome #11

1. Outcome Measures

- Not Reporting on this Outcome Measure

Assessment of Preparedness for Agricultural Bioterrorism in Arkansas (Quantitative measure included in Outcome #1)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agricultural bioterrorism is one of the important issues that emerged after the terrorist attacks of September 11, 2001 and subsequent anthrax related threats in the United States. The use of biological weapons to cause destruction of agriculture and agriculture related industries in various ways has become a menacing possibility. Any potential agroterrorism event can have local, national and international repercussions for producers, consumers, and the food and feed processing and distribution system. The Arkansas grain, feed and oilseeds industry is very important economically both in terms of domestic use and international exports.

The Agriculture Bioterrorism Protection Act of 2002 deals with the protection of U.S. agriculture. Under the Act the Food and Drug Administration is charged with regulation of the grain and oilseed industry. Specifically, the domestic and foreign facilities (and their U.S. agents) that "manufacture, process, pack or hold for human or animal consumption in the U.S". were to be registered with the FDA on Oct. 10, 2003. Facility registration is required for grain elevators, feed mills, flour mills, corn and oilseed processors, pet food manufacturers, renderers and others. Facilities also need to establish and maintain records containing information that is "reasonably available" to identify immediate previous source, immediate subsequent recipient, dates of inbound and outbound shipments, type and quantity of agricultural commodity received and shipped, identity and contact information of the transporter.

What has been done

To assess the preparedness of Arkansas grain, feed and oilseed facilities for agricultural bioterrorism, a questionnaire was sent out to all Arkansas grain and feed elevators and processors as well as seed and feed dealers. The survey was mailed to the grain and oilseed facilities in the state of Arkansas in July 2010 and 48 facilities responded to the survey. Information on facility type, size and history of vandalism, unauthorized entry, intentional contamination, sabotage, theft or threats was obtained. Information on testing procedures and plant security were also obtained. The study also assessed whether changes to preparedness had changed following the enactment and implementation of the Agriculture Bioterrorism Protection Act of 2002.

Results

The Arkansas grain and oilseed industry and government agricultural bioterrorism regulators will be helped by the information reported from this survey. This assessment provides a useful

evaluation of the readiness of the Arkansas grain and oilseed industry to address risks associated with agricultural bioterrorism. The study found that record-keeping systems that track commodities were in place in 71% of facilities before 2002 and 17% added systems after 2002. Over two-thirds of the facilities do not have quarantine procedures. Soybean processors and rice mills were most likely to have those procedures in place. Employee training for security and disaster-specific employee training were added by 19% of facilities after 2002. Currently 93% have employees trained to report suspicious activity. Computer and on-line security was added by 21% and a formal agreement with first responders was added by 14% since 2002. Still, about half of the facilities have no computer security measures, disaster training or first responder agreements. The study will be presented at the 2011 SAEA annual meeting as a selected paper. All Arkansas grain, feed and oilseed facilities and relevant government agencies will be sent copies of the report.

4. Associated Knowledge Areas

- 601 - Economics of Agricultural Production and Farm Management
- 602 - Business Management, Finance, and Taxation
- 603 - Market Economics
- 604 - Marketing and Distribution Practices
- 605 - Natural Resource and Environmental Economics
- 606 - International Trade and Development
- 608 - Community Resource Planning and Development
- 609 - Economic Theory and Methods
- 610 - Domestic Policy Analysis
- 611 - Foreign Policy and Programs
- 801 - Individual and Family Resource Management
- 803 - Sociological and Technological Change Affecting Individuals, Families, and
- 805 - Community Institutions, Health, and Social Services

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Interstate Policy Issues)

Brief Explanation

The 2009/10 fiscal year was one of the most challenging periods for Arkansas farmers, ranchers, businesses, communities, and state and local government due to punishing weather events, recessionary impacts and the ongoing financial crisis.

The 2009 and 2010 weather issues were extremely damaging to Arkansas' agricultural sector. For row crop producers 2009 was a historic wet planting and growing season and the rainy harvest period was one of the worst on record slowing harvest progress to a crawl. The problematic 2009 fall harvest dramatically impacted yield and quality for Arkansas rice, cotton, soybean, and feed grain producers.

In 2010 the weather pattern shifted from the influence of the global El Nino weather pattern, which brought the devastatingly wet 2009 planting, production, and harvest season, to the influence of a La Nina weather pattern, which for Arkansas tends to be droughty with periods of excessive heat.

The lingering El Nino weather influence remained uncharacteristically problematic for the 2010 row crop planting season. The rapid emergence of the global La Nina influence brought the expected and abnormal dry conditions but also introduced the unexpected historic heat stress to crops and livestock.

Rice producers experienced devastating reductions in their milling rate and grain producers as a group saw an abnormal wide range of yields. Grain producers experienced in many cases uncharacteristically low yields.

Weak economic conditions: Going into the 2009/10 fiscal year the University of Arkansas Division of Agriculture clientele were voicing two key major concerns: First, they were concerned about the recession's economic impact on their farm or business, government sector or community; and Second, they were concerned about the financial crisis' status and/or duration and economic impact on their farm or business, government sector or community.

By September 20, 2010 the recession that began in December 2007 was officially identified as having ended June 2009. The recession lasted 18 months, which makes it the longest of any recession since World War II. Previously the longest postwar recessions were those of 1973-75 and 1981-82, both of which lasted 16 months.

Now the question from our broad clientele was: Is the Financial Crisis over? The quick answer was the ongoing financial crisis continues.

This answer generated two key questions:
Why hasn't an extended long term recovery begun?
Why isn't the Financial Crisis over?

Typically with American recessions a quick rebound is expected, since tight monetary policy is normally the cause of U.S. recessions. The expectation was that when monetary policy was loosened, demand along with the economy would rebound.

What was different about this recession was it resulted from a financial crisis. The U.S. and the European area specifically have an almost indescribable debt crisis and debt burden that must be managed. Recoveries after financial crises are normally weak and slow as banking systems, businesses, individuals and national and local governments repair and

rebuilt balance-sheets and typically, this period of debt reduction lasts around seven-plus years.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

Economics and Commerce utilizes a variety of evaluation methods appropriate for the scope of programming.

Key Items of Evaluation

An example from our Family Resource Management Program includes the Ready, Set, Graduate program.

Issue

Youth financial literacy is low as reported by the national JumpStart Coalition for Youth Personal Financial Literacy. Most High School students are failing in their knowledge of personal financial management. Ready, Set, Graduate is a one day youth financial management program that combines learning sessions with real life simulation to equip graduating seniors with necessary financial management skills to get them started on their life journey.

What has been done

Ready, Set, Graduate is delivered to graduating High School seniors at their school. Students participate in three morning sessions on budgeting, credit, and banking presented by volunteer personnel from local banks. The afternoon session "The Mall of Life" involves community business people, volunteers, and bank personnel. Students choose a

career and receive a designated salary and taxes based on their salary. Then they visit stations to purchase insurance, groceries, transportation, housing, utilities, entertainment, and personal care items among other "necessities" for living on their own. They complete a personal budget as they visit each station. When complete, they have a better idea of what it really takes to pay their own way.

Results

The following is one example of the overall differences that now exist at the Clay County High School as a result of this program. Clay County High School graduates are now better equipped to handle their personal finances. Studies show that when students learn about saving, wise credit decisions, and responsible financial management they are more likely to save, use credit wisely and act financially responsible.

Students reported an increase in understanding after the program:

- Credit Cards: 82%
- Credit decisions will impact my future: 76%
- Budgeting: 77%
- Banking Services: 76%
- Writing a Check: 48%
- Filing out a Deposit Slip: 64%
- Endorsing a Check: 56%
- Purchasing a Car/Home: 81%
- Getting a Bank Loan: 81%
- Cost of Insurance: 75%
- Cost of Utilities: 70%

Students plan to do the following:

- Live within my means: 66%
- Balance my checking account with my bank statement monthly: 72%
- Be aware of cash traps and credit problems: 85%

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

Food, Nutrition & Health

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
502	New and Improved Food Products	2%		2%	
503	Quality Maintenance in Storing and Marketing Food Products	1%		2%	
701	Nutrient Composition of Food	5%		1%	
702	Requirements and Function of Nutrients and Other Food Components	12%		15%	
703	Nutrition Education and Behavior	25%		30%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	15%		25%	
724	Healthy Lifestyle	25%		25%	
806	Youth Development	15%		0%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	86.8	0.0	22.9	0.0
Actual	5.1	0.0	0.4	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
64119	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
85089	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
580438	0	228974	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Health and Nutrition:

The U of A Division of Agriculture faculty will develop, evaluate, and disseminate education programs, curricula, and educational publications. Conduct workshops, training and activities that incorporate new research emphasizing healthy lifestyles.

Programs include but are not limited to:

Walk Across Arkansas (Adults and Youth)- MOVED TO CHILDHOOD OBESITY PLANNED PROGRAM

Strong Women

ServSafe- MOVED TO FOOD SAFETY PLANNED PROGRAM

Food Stamp Nutrition Education- MOVED TO CHILDHOOD OBESITY PLANNED PROGRAM

FF-News- MOVED TO CHILDHOOD OBESITY PLANNED PROGRAM

Expanded Food and Nutrition Education Program- MOVED TO GLOBAL FOOD SECURITY AND HUNGER

Reshape Yourself Healthy Weight Program - MOVED TO CHILD HOOD OBESITY

Arthritis Education Series

Aging In Place

Acknowledging Aging

BeMedwise

Healthy Homes

Food Preservation and Safety- MOVED TO FOOD SAFETY

Commercial Food Safety & Processing:

1) To improve food processing efficiency through an improved understanding of food chemistry; 2) Determine the impact of food processing systems on product quality and food safety attributes; 3) Develop new food products that utilize Arkansas raw products; 4) Increase the research base on improved food processing systems to minimize food pathogens; 5) Improve detection systems for Listeria, Salmonella and other major food pathogens; 6) Identify health related nutritional factors that will improve human health; 7) Develop new food products that have improved nutritional content.

All of the activities below were moved to the new Food Safety Planned Programs:

Conduct quarterly HACCP Roundtable meeting

Conduct food safety workshops

Conduct Better Process Control School

Conduct the ServSafe workshop

Conduct new product development workshop

Provide assistance to small food companies

2. Brief description of the target audience

Multiple groups are reached through various delivery methods. Audiences include:

Food companies- MOVED TO FOOD SAFETY

Entrepreneurs and restaurants- MOVED TO FOOD SAFETY

Food service employees and/or food handlers- MOVED TO FOOD SAFETY

Limited resource adults and youth

Minority adults

Youth, adults and senior adults

Employers & employees- MOVED TO FOOD SAFETY

Child care providers

School personnel

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	170000	260000	21000	1000
Actual	11947	7202	163	81

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 4
 Actual: 1

Patents listed

White, B.L., Howard, L.R. and Prior, R.L. Process of extracting procyanidins by alkaline hydrolysis. US Patent Appl. 12/794.444, 2010.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	1	40	
Actual	2	33	35

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of grants written and funded in support of Food, Nutrition and Health programming and research

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	49	49

Output #2

Output Measure

- # of participants in educational programs leading to certification for food handlers (ServSafe and Better Process Control School and Culinology)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	710	0

Output #3

Output Measure

- # of participants in quarterly HACCP roundtable(Specialists only)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	140	0

Output #4

Output Measure

- # of non-duplicated Food, Nutrition and Health 4-H Youth programs delivered

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	275	0

Output #5

Output Measure

- # of non-duplicated participants in Food, Nutrition, and Health 4-H Youth programs

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	5000	0

Output #6

Output Measure

- # of Arkansas Commodity Board Grants

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	8	4

Output #7

Output Measure

- # of Federal grants and contracts

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	11	8

Output #8

Output Measure

- # of Food, Nutrition, and Health clientele contacts from educational events

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	117000	12109

Output #9

Output Measure

- # of Food, Nutrition, and Health educational events

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	7825	617

Output #10

Output Measure

- # of research projects conducted related to Food, Nutrition and Health-Experiment Station

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	59	60

Output #11

Output Measure

- # of food processing and safety laboratory services provided

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	45	0

Output #12

Output Measure

- # of Nutritional labels developed

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	70	0

V(G). State Defined Outcomes**V. State Defined Outcomes Table of Content**

O. No.	OUTCOME NAME
1	# of participants who indicated that they increased their knowledge related to food, nutrition and/or health following an educational class, seminar or workshop
2	# of participants receiving certification in Better Process Control School, Culinary Scientists and ServSafe
3	# of 4-H journals completed in Food, Nutrition and Health
4	# of individuals who increased physical activities as a result of completing an Extension program
5	# of Peer reviewed publications
6	# of participants who adopted positive nutrition practices.
7	# of participants reporting reduction in body weight after completing a nutrition education program
8	# of participants reporting reduction in blood pressure after completing a nutrition education program
9	# of participants reporting a reduction in blood cholesterol after completing an extension education program
10	# of participants reporting a reduction in blood glucose after completing an extension education program
11	# of new food businesses started
12	# of culinary participants sampled by survey that reported actual practice change as a result of the workshop within 2 years
13	# of small and very small meat and poultry plants that successfully completed an Action Plan developed in consultation with the University of Arkansas after a USDA-FSIS Food Safety Assessment
14	# of participants who practiced at least 1 technique learned in a health extension program
15	# of participants who practiced at least 1 technique learned in an environmental health Extension program
16	# of adults enrolled in the Strong Women program
17	# of adults who increased upper body strength after completing the Strong Women program

18	# of adults who increased lower body strength after completing the Strong Women program
19	# of Aging in Place (AIP) participants who indicated that they have gained new knowledge on universal design, assistive technology, services available, housing options or other issues related to aging in place
20	# of participants who adopted safe food preparation and preservation practices
21	# of adults enrolled in Strong Women program who completed assessment
22	Improved release of bound procyanidins from cranberry pomace by alkaline hydrolysis
23	Cranberry pomace partially ameliorates metabolic factors associated with high fructose feeding in growing Sprague-Dawley rats.
24	How to motivate parents to promote intake of calcium rich foods among early adolescents.
25	Incorporating conjugated linoleic acid (CLA) rich soy oil in the diet to reduce heart disease and diabetes risk factors.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

Not Reporting on this Outcome Measure

of participants who indicated that they increased their knowledge related to food, nutrition and/or health following an educational class, seminar or workshop

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	19000	9163

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #2

1. Outcome Measures

- Not Reporting on this Outcome Measure

of participants receiving certification in Better Process Control School, Culinary Scientists and ServSafe

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	690	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure
of 4-H journals completed in Food, Nutrition and Health

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	200	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products

- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure

of individuals who increased physical activities as a result of completing an Extension program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1100	431

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #5

1. Outcome Measures

- Not Reporting on this Outcome Measure
- # of Peer reviewed publications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	41	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #6

1. Outcome Measures

- Not Reporting on this Outcome Measure
of participants who adopted positive nutrition practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1400	7010

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #7

1. Outcome Measures

Not Reporting on this Outcome Measure

of participants reporting reduction in body weight after completing a nutrition education program

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	170	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

502 - New and Improved Food Products

503 - Quality Maintenance in Storing and Marketing Food Products

701 - Nutrient Composition of Food

702 - Requirements and Function of Nutrients and Other Food Components

703 - Nutrition Education and Behavior

712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

724 - Healthy Lifestyle

806 - Youth Development

Outcome #8

1. Outcome Measures

- Not Reporting on this Outcome Measure

of participants reporting reduction in blood pressure after completing a nutrition education program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	70	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #9

1. Outcome Measures

- Not Reporting on this Outcome Measure

of participants reporting a reduction in blood cholesterol after completing an extension education program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	40	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #10

1. Outcome Measures

- Not Reporting on this Outcome Measure

of participants reporting a reduction in blood glucose after completing an extension education program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #11

1. Outcome Measures

- Not Reporting on this Outcome Measure
of new food businesses started

2. Associated Institution Types

- 1862 Extension
 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
 Change in Action Outcome Measure
 Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
 503 - Quality Maintenance in Storing and Marketing Food Products
 701 - Nutrient Composition of Food
 702 - Requirements and Function of Nutrients and Other Food Components
 703 - Nutrition Education and Behavior
 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
 724 - Healthy Lifestyle
 806 - Youth Development

Outcome #12

1. Outcome Measures

- Not Reporting on this Outcome Measure

of culinary participants sampled by survey that reported actual practice change as a result of the workshop within 2 years

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	40	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #13

1. Outcome Measures

- Not Reporting on this Outcome Measure

of small and very small meat and poultry plants that successfully completed an Action Plan developed in consultation with the University of Arkansas after a USDA-FSIS Food Safety Assessment

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	4	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #14

1. Outcome Measures

Not Reporting on this Outcome Measure

of participants who practiced at least 1 technique learned in a health extension program

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	35	455

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In 2002, 59% of American reported they took an over-the-counter (OTC) medication in the last 6 months. Since then, medications misuse costs the nation well over \$177 billion dollars annually, resulting in extra physician visits, avoidable medication side effects, loss of productivity on the job, prolonged or exacerbated illnesses, unnecessary emergency room visits, hospitalizations and even death. As of the latest statistics, Arkansas has the highest rate of teen prescription drug abuse in the nation.

What has been done

The Cooperative Extension Service addresses health literacy through a medications literacy awareness initiative entitled "Be MedWise Arkansas". This program partners with the National Council for Patient Information and Education (NCPPIE) and several local agencies. Several lessons were created to address medicine misuse including how to choose over the counter medicine correctly, drug interactions, dietary supplements, prescription drug abuse, giving medicine to children correctly, storing and disposing medicine properly and how to talk to your doctor. In addition, Extension became a stakeholder in the "take-back" statewide efforts

Results

One thousand five hundred fifty nine (1,559) Arkansans attended at least one class. Eight-three percent (83%) reported an increase in knowledge. Over 95% participants surveyed reported practicing at least one technique learned in class. Participants reported the most important things learned were the importance of reading the entire drugs facts label, being more careful about mixing, storing and disposing medicines, and utilizing their pharmacists more to pose questions. One participant reported improved quality of life, more energy, and a savings of over \$100 a

month in prescription drug costs after learning he needed to show his doctor all the medicines he was taking. Arkansas participated in the national Take Back Day where county agents utilized the event for educating residents on medicine use. Seventy three out of seventy five of counties registered to participate in National Take Back Day and 5,407 pounds of pills were collected.

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #15

1. Outcome Measures

- Not Reporting on this Outcome Measure

of participants who practiced at least 1 technique learned in an environmental health Extension program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	35	7

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #16

1. Outcome Measures

- Not Reporting on this Outcome Measure
of adults enrolled in the Strong Women program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2000	1372

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components

- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #17

1. Outcome Measures

- Not Reporting on this Outcome Measure

of adults who increased upper body strength after completing the Strong Women program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2000	407

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

While strength-training is recommended for senior adults to maintain functional mobility and independence, only 13% of senior adults report regular strengthening activities. Rates are lower among low-income seniors. Only 5.7% of poor seniors report strength-training. Lifestyle changes like regular strength training have a large impact on helping older adults manage chronic disease such as diabetes and heart disease.

What has been done

StrongWomen is an evidence-based community strength-training program. It is based on research conducted by Tufts University. Program sessions meet twice weekly for one hour, and participants are led through a warm-up, eight to ten strengthening exercises using dumbbells and ankle weights, and a cool down/stretch and balance exercises. The standard format of the program is delivery in 12-week segments. In most states, after 12-weeks are up the program is over. However, Arkansas responded to the need of participants for ongoing support of their healthy behavior change with a solution for sustaining the program beyond the initial 12-weeks. Volunteer leaders expand the reach of the program.

Results

StrongWomen was offered in 37 counties. Volunteers instructed an estimated 14,000 exercise sessions, reaching approximately 2,000 participants in FY10 with duplicated contacts of 42,119. Fitness test data for FY10 show that 80% improved upper body strength, 80% improved lower body strength, 76% improved balance, 82% improved upper body flexibility, 81% improved lower body flexibility, and 81% increased aerobic endurance.

Value of Program:

*Volunteer time: Estimated \$563,920 per year, based on 14,000 sessions per year x 1 volunteer x 2 hrs (prep and instruction time) per session, using lowest estimate of value of volunteer time of \$20.14/hr from AR Department of Volunteerism.

oUsing value of volunteer time for those in leadership positions (\$100/hour) the value the time StrongWomen volunteers contribute is in excess of \$2.8 million per year.

*Savings to participants: The SWP saves participants nearly \$1.2 million dollars each year compared to the cost of membership at a fitness center.

*Direct medical costs: Based on the standard national statistics that 55% of women over the age of 50 will have a hip fracture, 93% of our program's participants should NOT have a hip fracture. Using the direct average cost of a hip fracture being \$13,470, the Strong Women program participants have avoided \$8.2 million in direct medical expenditures.

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #18

1. Outcome Measures

- Not Reporting on this Outcome Measure

of adults who increased lower body strength after completing the Strong Women program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2000	406

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #19

1. Outcome Measures

- Not Reporting on this Outcome Measure

of Aging in Place (AIP) participants who indicated that they have gained new knowledge on universal design, assistive technology, services available, housing options or other issues related to aging in place

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	400	151

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Lack of adequate and affordable housing is an issue in the state. An even greater issue is the lack of assessable housing for senior adults and disabled adults. The majority of these individuals wish to remain in their own homes instead of moving to assisted living or nursing homes.

What has been done

The University of Arkansas Division of Agriculture developed the "Aging in Place" program that focuses on assisting elders and individuals with disabilities to remain in their own homes through the use of Universal Design and Assistive Technology

Results

As a direct result of this program, two individuals did not have to move from their present residence in order to secure necessary support services in response to changing needs. With nursing home costs upward of \$2,500 a month, that is \$60,000 saved by the individual and the State.

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #20

1. Outcome Measures

- Not Reporting on this Outcome Measure

of participants who adopted safe food preparation and preservation practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #21

1. Outcome Measures

- Not Reporting on this Outcome Measure
of adults enrolled in Strong Women program who completed assessment

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	400	508

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #22

1. Outcome Measures

- Not Reporting on this Outcome Measure
Improved release of bound procyanidins from cranberry pomace by alkaline hydrolysis

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Cranberries are growing in popularity due to their high content of procyanidins and ability to prevent urinary tract infection. Polyphenolics found in cranberries are also thought to confer additional health benefits through antioxidant, antitumor, antiulcer, anti-inflammatory and anti-atherosclerotic activities. Cranberry pomace, the residue remaining from the juicing and canning processes, contains seeds and skins, the source of the polyphenolics responsible for health benefits associated with the berries. Unfortunately, the procyanidins in cranberries as well as other berries have a strong affinity for cell wall polysaccharides and are not released by normal extraction methods.

What has been done

This study evaluated the efficacy of sodium hydroxide treatment in releasing procyanidins from cranberry pomace. The optimal alkaline hydrolysis conditions to liberate procyanidins and depolymerize large molecular weight polymers from dried cranberry pomace were identified. Alkaline hydrolysis resulted in an increase in low molecular weight procyanidins and the increase was greater at higher temperature, short time combinations. When compared to conventional organic solvent extraction, treatment with sodium hydroxide increased procyanidin monomers and dimers by 15 and 8-fold, respectively. Additionally, alkaline extraction of the residue remaining after conventional organic solvent extraction resulted in further procyanidin extraction, indicating that procyanidins are not fully extracted by conventional extraction methods.

Results

The alkaline hydrolysis method developed has several important applications. 1) It can be used to estimate the amount of bound procyanidins in plant materials, 2) It can be used to increase levels of the small molecular weight procyanidin monomers and dimers (which are bioavailable) at the expense of the large molecular weight polymers (which are not bioavailable), and 3) It can be used industrially to recover procyanidins from waste materials to be used in dietary supplements or fortification purposes.

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #23

1. Outcome Measures

- Not Reporting on this Outcome Measure

Cranberry pomace partially ameliorates metabolic factors associated with high fructose feeding in growing Sprague-Dawley rats.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Cranberry pomace the by-product of cranberry processing can account for up to 20% of the initial fruit weight. The pomace is a rich source of polyphenols including anthocyanins, procyanidins, and flavonols, since the compounds are concentrated in the skins and seeds of the fruit and are retained in the pomace. Cranberries are one of few foods that contain A-type procyanidins, which have been linked to the prevention of insulin resistance and are also suggested to be the active components responsible for the prevention of urinary tract infections. We have previously demonstrated that extrusion processing of fruit by-products such as blueberry, grape and cranberry pomace can enhance the low molecular weight procyanidins that are bioavailable at the expense of some of their large molecular weight counterparts that are not readily absorbed. The goal of this research was to investigate the effect of feeding cranberry pomace on different metabolic characteristics associated with metabolic syndrome in high fructose fed growing rats.

What has been done

The effect of feeding cranberry pomace on selected metabolic parameters associated with high fructose feeding (58% by weight) was investigated in growing Sprague-Dawley rats. Compared to a positive control (modified AIN93 diet) high fructose feeding increased fasting plasma insulin, cholesterol, and triacylglycerols (TAG), post-prandial plasma TAG as well as homeostatic assessment models of insulin resistance and β -cell function, but not weight gain, diet intake and efficiency, abdominal fat, oral glucose tolerance, and fasting and post-prandial plasma glucose and cholesterol levels. Inclusion of cranberry pomace was effective in minimizing or ameliorating some of the metabolic anomalies, such as increased fasting plasma insulin, cholesterol, and TAG level as well as decreasing insulin resistance, especially when extruded cranberry pomace was fed at 3% of the diet. Feeding high fat diets was only partially effective in augmenting some of the metabolic factors associated with high fructose feeding, including triacylglycerolemia and insulin resistance, but not weight gain or abdominal obesity.

Results

Inclusion of 58% fructose in the purified diet did not produce a strong response in some of the metabolic parameters associated with metabolic syndrome in growing Sprague-Dawley rats such as weight gain, accumulation of abdominal fat, and increase in fasting plasma glucose. We suspect these young animals can adapt better to the nutritional intervention without developing some of the classical signs of positive energy balance, abdominal fat secretion or glucose intolerance that are associated with metabolic syndrome, but yet manifest some other metabolic parameters such as higher plasma TAG, increased insulin resistance, or elevated plasma insulin levels. Both extruded and un-extruded cranberry pomace were effective in mitigating or minimizing some of the negative effects of high fructose feeding with the greatest protection provided by extruded pomace at 3% of the diet. Further investigation is needed to determine the individual polyphenols present in cranberry pomace that may be responsible for improvements in metabolic parameters.

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #24

1. Outcome Measures

- Not Reporting on this Outcome Measure
How to motivate parents to promote intake of calcium rich foods among early adolescents.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Osteoporosis, a disease of the elderly, is most commonly connected to calcium; however it is not generally regarded as a childhood disease. Yet, the origins of osteoporosis putatively occur at the much younger age of 10 to 13 years during the period of peak bone acquisition. Parents and caregivers are a dominant influence on eating and activity behaviors of early adolescents and therefore play an essential role in preventing osteoporosis by promoting intake of CRF. However, few messages about improving CRF intake among early adolescents are directed to the parent's role. Little is known about what the content of these messages should be, how they would be perceived, and whether they would motivate parents to promote CRF to early adolescents. Key messages could address motivation and/or benefits to behavior change, barriers and strategies to enable parents to promote CRF intake among early adolescents.

What has been done

Given that little has been done to determine which messages would resonate with parent audiences regarding their role in promoting intake of CRF for their children, through this regional project, we propose to fill this void through qualitative methods. Risk communication literature and social marketing concepts indicate that behavior change involves understanding perceptions and motivations concerning the behaviors of interest. Qualitative research methods provide data that can only come from the persons engaged (or failing to engage) in the behaviors. Understanding whether parents perceive that their child is susceptible to risk from consuming diets low in CRF as well as the belief systems that influence those perceptions are needed to craft messages and develop programming that will motivate parents to change behavior.

Results

A multistate perspective will provide greater abilities to recruit a wide representation of the sample population, which is not feasible for groups working within a more narrow geographic reach. Studying a population from multiple states with diverse demographic characteristics will provide a rich database from which to identify motivations and test messages based on factors that may promote intake of calcium rich foods by early adolescents. This will help in the prevention of osteoporosis.

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #25

1. Outcome Measures

- Not Reporting on this Outcome Measure

Incorporating conjugated linoleic acid (CLA) rich soy oil in the diet to reduce heart disease and diabetes risk factors.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Dietary CLA is well recognized for its ability to protect against obesity related diseases. Three grams of CLA/day is proposed to be needed to obtain the optimal human health benefit, However, conventional CLA food sources such as beef and dairy contain low levels of CLA at 0.2-2% in milk-fat or beef-fat. Obtaining this level of CLA from naturally occurring sources of beef and dairy products would produce an unhealthy increase in dietary saturated fat and cholesterol increase. Production of foods with more CLA with low saturated fat and no cholesterol would promote a healthier diet. High CLA oil is being produced from soy oil, which is naturally composed of 50% linoleic acid (LA), by converting LA to CLA. The challenge is to incorporate this CLA safely into food acceptable to consumers.

What has been done

Some time ago we produced a 20% CLA- rich soy using ultraviolet light to convert soy oil LA to

CLA. We have subsequently increased the CLA levels during processing by adding food additives that promote health and well being. Furthermore, studies have shown that potato chips and salad oils produced from CLA rich soy oil are as shelf stable as similar products obtained using conventional soy oil. Furthermore, the CLA oil is stable under frying conditions. In addition we have produced a 100% CLA concentrate which is composed of the most common form of CLA found in CLA-rich oil which could be used as a dietary supplement of pharmaceuticals.

Results

Half an ounce of CLA-rich salad oil or an ounce and half of CLA-rich potato chips will provide the 3g of CLA needed to obtain the benefits of CLA.

In contrast, an 8 ounce serving of beef or milk will only provide 0.27g and 0.06g of CLA. Only by increasing saturated fat and cholesterol from these sources can 3g a day be realized. Therefore, increasing CLA-rich oil in the US diet would be a major fact in reducing heart disease and diabetes risk factors. A major US soy company is working with Division scientists to move soy CLA-rich oil production for food use towards commercialization.

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 701 - Nutrient Composition of Food
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle
- 806 - Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other

Brief Explanation

External factors that impacted outcomes included the following: 1) Program realignment impacted efforts expended in several of the listed programs within the new Food Safety initiative; 2) Several state defined outcomes were moved from the Food, Nutrition, and Health State Planned Programs to the Food Safety and Childhood Obesity; 3)

The Food Preservation program was a relatively new focus after being dormant for many years. New programs materials were developed and trainings offered: 4) A reduction in staff (FTEs), which reduced the amount of programming at the State level and in several counties had a negative impact on program delivery for the Food Safety and Food Preservation component; 5) The economic downturn impeded the replacement of staff and the attainment of resources for program implementation.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

One thousand five hundred fifty nine (1,559) Arkansans attended at least one BeMedwise class. A survey of participants indicated the following: Eight-three percent (83%) reported an increase in knowledge; Over 95% participants surveyed reported practicing at least one technique learned in class; Participants reported the most important things learned were the importance of reading the entire drugs facts label, being more careful about mixing, storing and disposing medicines, and utilizing their pharmacists more to pose questions.

Key Items of Evaluation

Within the Strong Women program fitness test data for FY10 show that 80% improved upper body strength, 80% improved lower body strength, 76% improved balance, 82% improved upper body flexibility, 81% improved lower body flexibility, and 81% increased aerobic endurance.

As a direct result of the Aging In Place program, two individuals did not have to move from their present residence in order to secure necessary support services in response to changing needs. With nursing home costs upward of \$2,500 a month, that is \$60,000 saved by the individual and the State.

BeMedwise Program: One participant reported improved quality of life, more energy, and a savings of over \$100 a month in prescription drug costs after learning he needed to show his doctor all the medicines he was taking. Arkansas participated in the national Take Back Day where county agents utilized the event for educating residents on medicine use. Seventy three out of seventy five of counties registered to participate in National Take Back Day and 5,407 pounds of pills were collected.

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Natural Resources & Environment

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	5%		5%	
102	Soil, Plant, Water, Nutrient Relationships	5%		5%	
111	Conservation and Efficient Use of Water	15%		10%	
112	Watershed Protection and Management	15%		20%	
122	Management and Control of Forest and Range Fires	5%		5%	
123	Management and Sustainability of Forest Resources	20%		20%	
124	Urban Forestry	5%		5%	
131	Alternative Uses of Land	5%		5%	
133	Pollution Prevention and Mitigation	10%		10%	
135	Aquatic and Terrestrial Wildlife	10%		10%	
605	Natural Resource and Environmental Economics	5%		5%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	14.9	0.0	21.7	0.0
Actual	10.9	0.0	10.2	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
136526	0	159104	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
181176	0	161345	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1235899	0	4575348	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Develop educational materials, curriculum, & resources
 Geographic Information Systems (GIS) and Geographic Positioning Systems (GPS) training
 Site visits, one-on-one consultations
 Workshops
 Field Days
 Farm Visits
 Demonstrations
 Educational Meetings
 News articles
 Newsletter
 Web-based Education
 Continuing Education
 Basic and Applied Research

2. Brief description of the target audience

Agri Business
 Agricultural Producer Organizations
 Agricultural Producers
 Certified Crop Advisors
 Conservation District Directors
 Consultants
 Forest Landowner Groups
 Forest Industry
 Loggers
 Natural Resource Professionals
 Landowners
 Homeowners
 Educators
 State & Federal Agency personnel
 Watershed Organizations
 Wildlife Organizations
 Private nutrient applicator
 Commercial nutrient applicator

- General public
- Researchers
- Policy makers
- Youth
- Extension faculty & staff
- Teaching faculty
- Research funding personnel and agencies
- Registered foresters

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	10000	50000	2500	250
Actual	12725	199809	1358	321

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	7	13	
Actual	10	20	30

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of programs held for professional natural resource managers
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	20	6

Output #2

Output Measure

- Number of Natural Resource Educational Meetings conducted for landowners/public

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	50	72

Output #3

Output Measure

- Number of Natural Resource Field Demonstrations

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	30	50

Output #4

Output Measure

- Number of Natural Resource Field Days

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	6	11

Output #5

Output Measure

- Total Number of Natural Resources program participants through all programs and activities

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10000	14083

Output #6

Output Measure

- Total Number of Natural Resources programs and events

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	120	133

Output #7

Output Measure

- Number of Acres enrolled in Arkansas Acres for Wildlife

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	1240300	503301

Output #8

Output Measure

- Number of Educational Materials & Curriculum developed

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10	20

Output #9

Output Measure

- Number of Natural Resource Newsletters developed

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	2	3

Output #10

Output Measure

- Number of web-based modules, sites developed and/or maintained

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	12	4

Output #11

Output Measure

- Number of education programs on urban stormwater management

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	40	268

Output #12

Output Measure

- Number of participants in urban stormwater management programs

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	500	3083

Output #13

Output Measure

- Number of natural resources/environmental events for row crop producers

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	20	14

Output #14

Output Measure

- Number of natural resources/environmental events for livestock producers

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	20	22

Output #15

Output Measure

- Number of Educational Materials & Curriculum delivered

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	50000	4153

Output #16

Output Measure

- Number of Natural Resource Newsletters delivered

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	40000	11956

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of landowners indicating an increased knowledge of natural resource management
2	Number of clientele who adopt Best Management Practices in Natural Resource management that protect and enhance water quality
3	Number of Landowners who adopt wildlife management practices that enhance wildlife habitat or prevent & control wildlife damage to property
4	Number of registered foresters maintaining CFEs
5	Number of participants indicating an increased knowledge of stormwater issues
6	Number of clientele who reported knowledge gained related to aquaculture.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of landowners indicating an increased knowledge of natural resource management

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2000	720

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

More than half of the State is forested and most of this forest land is owned by independent woodland owners. Meeting the demand for forest products and other benefits is dependent on their management decisions. Forest land ownership is becoming fragmented and focused on short-term economic returns or development for non-forest uses. Demand for timber, clean water, biodiversity, and biomass will place greater demands on forest lands. Educating landowners to manage for multiple benefits is a key priority because the top landowner objective is not timber production.

What has been done

Landowner education is facilitated through several different types of programs at the county, state and regional level. County agents develop and host forest landowner meetings often collaborating with other state conservation organizations. Newsletters, news articles, and web-based education are used to reach landowners across the state with the latest information regarding natural resource management.

Existing research and demonstration plots and projects on stations around the state, support workshops, seminars, and field days.

Results

Results from landowner education efforts vary widely and are reported by individual county agents and State faculty members. Of the 106 landowners surveyed during four forest management field days, 91% stated that their knowledge and understanding of forest management increased. One landowner wrote that his/her knowledge increased 100% as a result of attending the hardwood management field day. Nearly 80% of the landowners surveyed

stated that they would seek professional forester assistance to develop a forest management plan on their property. Of 68 landowners surveyed, 66 said that they would change a practice as a result of attending the workshop. A surprising 60% of participants attending a bio-energy field day said that they would likely be interested in implementing bio-energy crops as a result of attending the field day.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 605 - Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of clientele who adopt Best Management Practices in Natural Resource management that protect and enhance water quality

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	519

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Eastern Arkansas has hundreds of stream miles considered impaired by turbidity. EPA considers siltation from row crop agriculture as the leading source of stream impairments in Arkansas. The loss of nutrients in runoff from applications of animal manures to pasture as fertilizer is an issue of great concern in North and West Arkansas. It has prompted new state nutrient management regulations, two federal lawsuits against the poultry industry and an increased concern to poultry producers over their long-term sustainability.

What has been done

The University of Arkansas Division of Agriculture is conducting field research and education on reducing agriculture's contribution to nonpoint source pollution to include programs addressing nutrient management, soil and water conservation, and the effectiveness of selected BMPS in reducing sediment and nutrients in runoff from agricultural operations.

Results

As a result of our research and educational efforts, we believe that row crop producers are implementing BMPS to reduce pollutant loads from crop production in the Mississippi Delta of Arkansas. And that livestock producers are implementing BMPS to reduce nutrient loss from pastures treated with poultry litter in the Ozark Highlands region of Arkansas. With regard to nutrient management, we have provided professional development for 75 planners who contributed to the completion of 238 comprehensive nutrient management plans.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 605 - Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of Landowners who adopt wildlife management practices that enhance wildlife habitat or prevent & control wildlife damage to property

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3500	616

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Private landowners account for approximately 80% of the landholdings in Arkansas. Those who adopt wildlife management practices will help not only high visibility species such as white-tailed deer and wild turkey, but also species of concern such as northern bobwhite, spotted skunk, and 300+ lesser known species described in the state wildlife action plan. Reducing wildlife damage provides a win-win for both landowners and wildlife. The economic costs can be substantial.

What has been done

Extension agents in 75 county offices and professional wildlife and forestry faculty have conducted workshops, co-coordinated conferences, answered public inquiries, prepared and distributed fact sheets, newsletters, and educational seed packets, and posted information on websites. In one workshop alone, 90 landowners received training and resources about white-tailed deer management with an emphasis on using native plants to manage the landscape. The Extension website provides an ask the expert option.

Results

Over 600 contacts were made at local events and meetings concerning wildlife management on private lands. Approximately 93% of 128 surveyed participants indicated that their knowledge concerning habitat management increased. Data collected from Specialist-led programs suggest that over 616 landowners gained knowledge about wildlife and its management; 68 learned about wildlife management policies and programs including the Farm Bill; 280 stated that they would implement a new wildlife management practice; 82 planned to adopt practices designed to minimize wildlife damage; and 9 planned to develop a management plan. 72 participants learned about enhancing wildlife habitat along riparian corridors, replanting of 3.5 miles of riparian buffers.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 122 - Management and Control of Forest and Range Fires

- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 605 - Natural Resource and Environmental Economics

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of registered foresters maintaining CFEs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	605	519

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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 500 registered foresters. Each must complete six hours of continuing education annually to remain registered. The Continuing Education program works to fulfill these educational requirements of foresters in particular and other professionals in general.

What has been done

The Forestry Continuing Education program works with the Arkansas Board of Registered Foresters, local Society of American Foresters chapters, the Arkansas Forestry Association, and a Continuing Education Advisory Committee to help plan and organize appropriate meetings and workshops. Although state law mandates that foresters maintain registration, continuing education credit hours are reviewed and granted through the National Society of American Foresters.

Results

The Cooperative Extension Service is the lead agency in providing continuing education credits for registered foresters and other natural resource professionals. In 2010, three different courses sponsored by the State Board of Registration for Foresters attracted 441 registered foresters. All attendees received continuing education credit hours. Over 115 land managers and foresters were trained to implement the latest Tree Farm and Forest Stewardship standards. The Wildlife Habitat Restoration on Private Lands Conference was attended by 115 natural resource professionals from Arkansas and surrounding states.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 605 - Natural Resource and Environmental Economics

Outcome #5

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants indicating an increased knowledge of stormwater issues

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	250	550

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Urban water quality continues to grow in importance and relevance to local residents. In one city, Fayetteville, the implementation of a new riparian zone ordinance stimulated public interest.

What has been done

County Agents in Washington County conducted an urban water quality education program related to the benefits of riparian zone protection. Over 1800 local residents were reached through ten monthly newsletters, educational meetings and demonstration events.

Results

Agents documented over 550 Best Management Practices (BMPs) implemented as a result of the education effort. Over 1200 people outside the riparian zone target area have also become involved in the water quality protection network. Approximately 140 residents in the riparian zone have implemented multiple BMPs.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 605 - Natural Resource and Environmental Economics

Outcome #6

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of clientele who reported knowledge gained related to aquaculture.

2. Associated Institution Types

- 1862 Extension

- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 122 - Management and Control of Forest and Range Fires
- 123 - Management and Sustainability of Forest Resources
- 124 - Urban Forestry
- 131 - Alternative Uses of Land
- 133 - Pollution Prevention and Mitigation
- 135 - Aquatic and Terrestrial Wildlife
- 605 - Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Changes in the ways data is collected)

Brief Explanation

Program delivery was shifted several times through the year because of the need to supply immediate information to constituents and county agents. Additionally, programs have been refocused to deal with the broad range of biofuel topics that require a global shift of effort. An effort to define appropriate technologies and their adaptability to Arkansas conditions has shifted much of our research effort to these topic areas.

New state based program planning needs for both water quality and use have placed added demands on both Research and Extension resources.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

Field days, workshops, and other educational events are evaluated for content and future direction during or immediately after the program. Evaluations are usually administered by the program coordinators including county agents, Extension faculty, and other program coordinators. Information gathered from evaluations is used to plan future programs, collect information about program effectiveness, and gauge participants' interest in other topics. Much of this data is then entered into an Extension database and then aggregated across individuals and programs. The reports generated provide information important for determining future educational programs.

Many educational meetings and workshops are developed collaboratively with industry, agency, and other stakeholders. These groups meet periodically to assess and evaluate programs resulting in either new and/or modified programs.

Individual faculty members are also evaluated to determine program direction and modification..

Key Items of Evaluation

Program participant evaluations along with cooperator and internal reviews will assist in determining the future direction of all programs.

Due to the increased focus on water quality in this state we are constantly looking for new ways to reach these audiences to gauge their understanding and perceptions.

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Pest Management

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
211	Insects, Mites, and Other Arthropods Affecting Plants	10%		10%	
212	Pathogens and Nematodes Affecting Plants	20%		20%	
216	Integrated Pest Management Systems	25%		25%	
312	External Parasites and Pests of Animals	20%		20%	
403	Waste Disposal, Recycling, and Reuse	5%		5%	
721	Insects and Other Pests Affecting Humans	10%		10%	
723	Hazards to Human Health and Safety	10%		10%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	30.6	0.0	2.2	0.0
Actual	21.3	0.0	1.7	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
265636	0	52385	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
352511	0	53123	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2404673	0	423339	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The University of Arkansas Division of Agriculture research program in pest management will reduce the impacts of major pests by: increasing the knowledge base on major pests, diseases, and weeds of importance to Arkansas; developing improved crop protection strategies and technologies for our major crop systems; and integrating new knowledge in plant and animal genomics and basic science into the development new pest management strategies. Our methods will include grower meetings, training extension agents and crop consultants, educational newsletters, Extension publications, visits to individual growers /homeowners, diagnosis of pest problems, newspaper/magazine /professional journal articles, interviews, field days, web-based information, and/or applied on- farm research.

Extension Pest Management education will be delivered through the following programs and methods, targeting issues specific to Arkansas:

The Cotton Nematode and Disease Management Program supports and assists county extension programs in the state, particularly the Delta region to better identify, understand, and manage major cotton diseases in Arkansas.

The Pesticide Applicator Training Program provides initial certification and recertification training sessions for private and commercial/non-commercial pesticide applicators statewide each year. County agricultural Extension agents provide the training for private applicators (farmers), and the pesticide assessment specialist is responsible for training the commercial/non-commercial applicators.

The Cotton, Rice and Soybean IPM Programs offer simple grant funding for county extension education efforts focused primarily on integrated pest management of cotton, rice and soybean pests. County extension education efforts are aimed at improving crop production and pest management through adoption of research-based recommendations.

The Rice, Soybean, and Wheat Pathology Programs assist county extension programs to educate growers and others involved to better identify, understand and manage the many rice, soybean, and wheat diseases in Arkansas.

The Weed Management Program assists row-crop producers in applying appropriate and diverse weed management methods to minimize losses from weeds, while also attempting to minimize or delay herbicide resistance.

The Soybean Cultivar Disease Screening Program assists soybean producers in selecting the most appropriate soybean cultivars for their farms to avoid costly losses from soybean diseases and nematodes.

As part of the Diversified IPM Program, urban and commercial horticulture educational programs are delivered to train urban and commercial vegetable, ornamental, turf and fruit clientele in pest and plant disease management practices.

Human Integrated Pest Management will develop sound recommendations for IPM targeting pests

affecting humans, and to deliver the recommendations to a variety of sectors of the public. Pests to be targeted include Africanized bees, termites, and fire ants in residential settings. Delivery methods include presentations at educational meetings and workshops, extension publications and newsletters, web-based materials and visits to households of affected citizens.

2. Brief description of the target audience

- Crop producers
- Livestock producers
- Division of Agriculture personnel
- Agricultural consultants
- Agricultural industry personnel
- Pesticide applicators
- Pest Control Operators
- Homeowners
- Golf course superintendents
- Commercial pest management personnel
- Master gardeners
- Commercial landscapers
- Landscape management staff
- Public Health Officials
- Other researchers
- Students
- Extension Specialists
- Research Funding Personnel and Agencies
- Policy and Decision Makers
- Regulatory Personnel
- State Plant Board Personnel
- General Public

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	70000	70000	0	0
Actual	47898	78920	571	348

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	5	50	
Actual	11	46	57

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of farm tours related to pest management

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	60	109

Output #2

Output Measure

- # of farm visits made related to pest management

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	6000	6511

Output #3

Output Measure

- # of pesticide applicator education classes

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	100	93

Output #4

Output Measure

- # of homeowner education classes related to pest management

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	30	40

Output #5

Output Measure

- # of research field days related to pest management

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	15	30

Output #6

Output Measure

- # of workshops related to pest management

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10	28

Output #7

Output Measure

- # of newsletter articles related to pest management

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	70	189

Output #8

Output Measure

- # of Arkansas Commodity Board grants received

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	8	10

Output #9

Output Measure

- # of federal grants and contracts

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	5	4

Output #10

Output Measure

- # of educational classes related to pest management

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	224	207

Output #11

Output Measure

- # of Pest Management clientele contacts from education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational methods

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	70000	48298

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	# of participants gaining knowledge of proper pesticide application practices
2	# of participants passing commercial pesticide certification exams
3	# of submissions to diagnostic clinic
4	# of clients using scouting programs
5	# of pest monitoring traps utilized
6	Annual soybean yield - bushels per acre
7	Annual value of soybean production (1,000 Dollars)
8	Annual rice (all) yield -- pounds per acre
9	Annual value of rice (all) production (1,000 dollars)
10	Annual cotton (all) yield -- pounds per acre
11	% of soybean acreage receiving herbicide applications
12	Pounds (1,000) of herbicides applied to planted soybean acreage
13	% of soybean acreage receiving insecticide applications
14	Pounds (1,000) of insecticides applied to planted soybean acreage
15	% of soybean acreage receiving fungicide applications
16	Pounds (1,000) of fungicides applied to planted soybean acreage

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

Not Reporting on this Outcome Measure

of participants gaining knowledge of proper pesticide application practices

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3500	7586

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Pesticide applicators need proper training to assure safe use and disposal of the pesticides. There are approximately 20,300 private pesticide applicators in Arkansas that must receive training for recertification at least once every five years.

What has been done

Approximately 4,500 Arkansas agricultural producers were certified or recertified as private pesticide applicators during the 2009/2010 training season. These people were certified/recertified at 2-3-hour pesticide applicator training (PAT) sessions conducted statewide by county Extension agents. The PAT training includes information on pesticide labeling, safety precautions, first aid, protective gear, storage, handling, disposal, integrated pest management, environmental concerns, application equipment and calibration, groundwater protection, pesticide recordkeeping, and spray drift management.

Results

Certifying pesticide applicators helps reduce accidental human exposure, whether from off-target drift, misapplication or handling errors. The PAT program in Arkansas reaches those producers, and private and commercial applicators needing the appropriate training for certification.

4. Associated Knowledge Areas

211 - Insects, Mites, and Other Arthropods Affecting Plants

212 - Pathogens and Nematodes Affecting Plants

- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #2

1. Outcome Measures

- Not Reporting on this Outcome Measure

of participants passing commercial pesticide certification exams

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	400	306

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There is a continuing need to provide quality education opportunities and materials to Pest Management Professionals that provide commercial services to the Arkansas public. These individuals are certified through the Arkansas State Plant Board through training and educational materials produced and maintained by the Extension Urban Entomology Program. Through the efforts of the Extension Urban Entomology Program, up-to-date training and educational materials are made available for use in training commercial Pest Management Professionals.

What has been done

The Extension Urban Entomology Program updates and maintains the extension produced education materials used to train and certify professional commercial and non-commercial pesticide applicators. Training material is available online and study is self paced. Individuals not passing the exam can continue their studies and retake the exam after a mandatory 3 month waiting period.

Results

All individuals seeking certification as a commercial or non-commercial pesticide applicator in the above areas now must attain, through the use of extension produced study materials, a level of

expertise that enables them to pass the subject exams in their desired certification area. There were 405 licensed individuals that received recertification education. Approximately 60% passed the examinations, allowing them to get pest control licenses.

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure
of submissions to diagnostic clinic

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2000	889

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure
- # of clients using scouting programs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	750	2726

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The majority of the IPM decisions made in cotton are made by consultants rather than growers in Arkansas. Approximately 95 percent of the cotton in Northeast AR is scouted weekly for insects. In the past insect scouts would check fields weekly, reporting pest levels to growers. The grower would use this information to make pest management decisions. As farm sizes increase, more growers are moving toward hiring crop consultants, who not only scout fields but make recommendations on control measures. The level of recommendations may be that the field has reached an action threshold and the grower needs to make an insecticide application, leaving the choice of insecticide or control measure to the grower, or may go as far as a tailored prescription on control options and what to use.

What has been done

A cotton insect scouting school was conducted in Northeast Arkansas at the beginning of the growing season. Crop consultants, as well as the scouts they hire, were targeted for attendance. Approximately 45 were in attendance at the school. School attendees were educated on cotton

insect and mite pest identification, scouting procedures, damage and University recommended thresholds. A test was given to all attendees at the end of the school to measure retention of information. The majority of attendees did well on the test.

Results

Forty-five crop consultants were educated on current IPM recommendations at scout schools and production meetings. Those in attendance provide consultation on approximately 65,000 acres. Scouts can alert growers to pest problems early, when minimal intervention methods can help solve the problem, thus reducing losses and overuse of pesticides.

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #5

1. Outcome Measures

- Not Reporting on this Outcome Measure

of pest monitoring traps utilized

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	230	472

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

From July to early August, adult green June beetles often mass attack and destroy ripening fruit of apple, blackberry, corn, grape, peach and raspberry. Most insecticides cannot be used against the green June beetle due to the potential for toxic residue on harvested fruit. Thus, we are

developing an inexpensive trap as an alternative protective tactic to insecticides.

What has been done

In July and early August, our efforts in Green Forest, Arkansas, along with work with cooperators in Mountain Grove, Missouri, compared the relative attractiveness to green June beetles of a differently colored traps placed at different heights and baited with different release rates and percentage concentrations of isopropanol (rubbing alcohol). We tested a low-cost trap to detect presence of June beetles, made of a 2-liter, clear beverage bottle, hung upside down at two foot height above ground, baited with a 60 percent isopropanol solution.

Results

Commercial fruit growers and backyard fruit producers can build their own traps for as little as \$2.50 per trap per season. These simple traps can be set out in late June and detect first dispersal of green June beetles toward fruit plantings. This will alert the grower to check the fruit planting for green June beetles and selectively apply insecticide sprays. In the future, we hope to have further developed this system to mass attract and kill green June beetles at the perimeter of a fruit planting.

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #6

1. Outcome Measures

- Not Reporting on this Outcome Measure
Annual soybean yield - bushels per acre

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
------	---------------------	--------

2010

38

35

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Soybean diseases, if left unchecked, can reduce yields considerably. A need to apply application thresholds will help reduce fungicide use and also help maximize yields.

What has been done

We have developed a foliar fungicide screening program to evaluate application thresholds, timings, and rates of soybean fungicides to an array of our most common endemic foliar diseases. This program utilizes artificially inoculated plots and naturally infested plots as appropriate to evaluate and refine foliar disease management recommendations to our soybean producers as "new fungicides" come on the market in the southern U.S. These replicated trials represent a comprehensive effort to improve our economically sustainable soybean production systems by fine-tuning foliar disease management recommendations which contribute to profitable soybean production. All information is made available to growers, consultants, crop advisors, extension personnel, and the soybean industry through websites for immediate access.

Results

Yield losses in Arkansas each year due to foliar diseases have been estimated by the Southern Soybean Disease Workers group at around 10% or about 12 million bushels. Proper fungicide selection, rate, and timing could conservatively reduce these losses by at least half, with a resulting annual increase of over 6 million bushels of soybean harvested by Arkansas producers.

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #7

1. Outcome Measures

- Not Reporting on this Outcome Measure
 - Annual value of soybean production (1,000 Dollars)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	791094	1177000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #8

1. Outcome Measures

- Not Reporting on this Outcome Measure
Annual rice (all) yield -- pounds per acre

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6610	6480

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #9

1. Outcome Measures

- Not Reporting on this Outcome Measure
Annual value of rice (all) production (1,000 dollars)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	740648	1330262

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #10

1. Outcome Measures

- Not Reporting on this Outcome Measure
Annual cotton (all) yield -- pounds per acre

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	916	1047

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #11

1. Outcome Measures

- Not Reporting on this Outcome Measure
% of soybean acreage receiving herbicide applications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	95	98

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #12

1. Outcome Measures

- Not Reporting on this Outcome Measure

Pounds (1,000) of herbicides applied to planted soybean acreage

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	4152	8466

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #13

1. Outcome Measures

- Not Reporting on this Outcome Measure
% of soybean acreage receiving insecticide applications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	14	79

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Recent changes in the soybean production system including reduced tillage, round-up ready technology, and early season production system have resulted in shifts in pest status for many soybean insects. These, along with increased value of the commodity and increased costs of production, have resulted in the need to educate growers and decision-makers (consultants and distributor field men) on the importance of insect scouting to insure growers do not lose yield potential because of insects.

What has been done

In 2010 Extension Entomologists conducted soybean scouting schools targeting growers, consultants, and other field people. Three scouting schools were conducted. Training included sampling techniques, insect identification, estimating damage and thresholds for insect pests and pest complexes. The agronomist provided information on growth and physiology of soybean and growth stages. There were 142 participants.

Results

Surveys of participants indicated that the increase in knowledge particularly relating to sampling techniques and damage assessment had increased significantly. County agent surveys indicate a 25% increase in acreage now scouted on a regular basis and crop consultants indicate that the soybean acreage they scout has increased almost 40% in the last two years. Recent reports indicate that scouted acreage is above 60% in Arkansas compared to less than 40% only 5 years ago. With outbreaks of stink bugs and corn earworm in 2010 over 2500,000 acres were treated with an insecticide maintaining economic profit for growers.

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse

- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #14

1. Outcome Measures

- Not Reporting on this Outcome Measure
Pounds (1,000) of insecticides applied to planted soybean acreage

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	344	846

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #15

1. Outcome Measures

- Not Reporting on this Outcome Measure
 % of soybean acreage receiving fungicide applications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	8	59

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 216 - Integrated Pest Management Systems
- 312 - External Parasites and Pests of Animals
- 403 - Waste Disposal, Recycling, and Reuse
- 721 - Insects and Other Pests Affecting Humans
- 723 - Hazards to Human Health and Safety

Outcome #16

1. Outcome Measures

Not Reporting on this Outcome Measure

Pounds (1,000) of fungicides applied to planted soybean acreage

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	21	828

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

211 - Insects, Mites, and Other Arthropods Affecting Plants

212 - Pathogens and Nematodes Affecting Plants

216 - Integrated Pest Management Systems

312 - External Parasites and Pests of Animals

403 - Waste Disposal, Recycling, and Reuse

721 - Insects and Other Pests Affecting Humans

723 - Hazards to Human Health and Safety

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (NASS)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other (NASS)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Plants & Plant Products (Non-Food Related)

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%		0%	
102	Soil, Plant, Water, Nutrient Relationships	10%		0%	
111	Conservation and Efficient Use of Water	10%		0%	
112	Watershed Protection and Management	10%		0%	
201	Plant Genome, Genetics, and Genetic Mechanisms	10%		0%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	10%		0%	
204	Plant Product Quality and Utility (Preharvest)	10%		0%	
205	Plant Management Systems	10%		0%	
206	Basic Plant Biology	10%		0%	
213	Weeds Affecting Plants	10%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	69.6	0.0	35.5	0.0
Actual	41.4	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
517750	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
687079	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
4686941	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Develop and conduct workshops, educational meetings, demonstrations, and field days
- Direct clientele contact: on- site visits, phone calls, mail and emails
- Develop and produce educational products and materials
- Conduct tours and demonstrations
- Publish educational materials
- Media work through print, radio, TV and internet
- Partnering with commodity associations, groups, Master Gardeners, and traditional and nontraditional groups
- Coordination of Master Gardener programs
- Develop improved crop production systems that maximize profitability and sustainability

2. Brief description of the target audience

Growers/producers
 Consultants
 Agri Business/Allied Industries
 Horticulture production and Service Businesses
 Master Gardeners
 General Public
 Other researchers
 Students
 Extension Specialists
 Teaching faculty
 Public

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	206500	436000	0	0
Actual	102873	109482	5048	201

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 10
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	10	100	
Actual	10	0	10

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of agronomic production education meetings (multi-topic)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	250	249

Output #2

Output Measure

- # of demonstrations/on-farm research

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	192	237

Output #3

Output Measure

- # of farm visits

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	364	5114

Output #4

Output Measure

- # of row crop field days
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10	104

Output #5

Output Measure

- # of educational meetings, demonstrations, field days, site visits, and other group events held to educate commercial and consumer clientele in horticulture
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	650	17741

Output #6

Output Measure

- # of educational meetings, demonstrations, farm visits and/or field days held to educate clientele on forage production and grazing management
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	2600	8240

Output #7

Output Measure

- # of Arkansas Commodity Board Grants received
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	50	1

Output #8

Output Measure

- # of federal grants and contracts
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	25	1

Output #9

Output Measure

- # of Plants & Plant Products clientele contacts from education classes, workshops, group

discussions, one-on-one interventions, demonstrations, and other educational methods

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	201000	6737

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	# of commercial forage producers who gained knowledge related to management technology
2	# of commercial forage producers who gained knowledge related to production practices
3	# of new Master Gardeners trained and certified
4	# of commercial forage producers who changed or adopted a new forage management practice
5	# of non commercial participants who changed or adopted a new forage and/or grazing management practice
6	# of clientele using soil testing
7	# of clientele using plant testing
8	# of clientele using water testing
9	# of clientele (non-duplicated) who use the DD50 program for improved rice production efficiency
10	# of impacted acres using the DD50 program for improved rice production efficiency
11	# of clientele using RICESEED program
12	# of acres planted based on output from RICESEED program
13	# of Master Gardeners who recertified
14	# of new horticultural businesses and new farmers markets
15	Acres of harvested wheat (all)
16	Yield (bushels per acre) of harvested wheat (all)
17	Acres of harvested soybeans (all)

18	Yield (bushels per acre) of harvested soybeans
19	Acres of harvested rice (all)
20	Yield (pounds per acre) of harvested rice (all)
21	Acres of harvested cotton (all)
22	Total yield (lbs) of harvested cotton
23	Acres harvested of hay (all)
24	Yield (tons)of harvested hay (all)

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

Not Reporting on this Outcome Measure

of commercial forage producers who gained knowledge related to management technology

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	200	4039

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Winter feeding is the single largest cost of maintaining a livestock herd. The average hay feeding period in Arkansas begins in early November and lasts until early April for a typical length of 135

days. By using improved forage and grazing management practices, producers can reduce the length of the hay feeding period and extend their grazing season to 300 days or more. The 300 Day Grazing Program was designed to help producers achieve that goal.

What has been done

The 300 Day Grazing Program was developed in 2008 by the Animal Science advisory committee, which is made up of county agents and animal science faculty. It includes 8 different forage management practices that can be demonstrated on producer farms to help extend the grazing season. It is a statewide demonstration program designed so a county agent could work with a producer to implement one of the management practices based on the producer's operation. In addition, three farms were selected to implement as many practices as needed to achieve a 300 Day grazing season. A control demonstration was conducted on the Livestock and Forestry Branch Station where Animal Science faculty implemented the same practices on a demonstration herd with the goal of a 300 Day grazing season.

The demonstration practices include: adding legumes to pastures, rotational grazing, stockpiling warm- and cool-season grasses, grazing winter and summer annual forages, and reducing hay losses during storage and feeding. A step-by-step protocol for each demonstration was written for agents and producers to ensure consistency among demonstrations.

Results

Livestock and Forestry Branch Station - Batesville: A herd of 38 fall calving cows was managed under the 300 day grazing demonstration protocols. Hay was only fed for 18 days the first winter of the project and 54 days the second winter. Fertilizer cost was reduced compared to previous management of the pastures. Forage quality of properly managed and fertilized stockpiled fescue was adequate to meet the nutritional needs of the herd. In contrast, forage quality of stockpiled fescue managed as a typical producer would did not meet the herd's nutritional needs. This result has direct application for Arkansas farms. Grazing management timing and planting of clover was coordinated to establish excellent red clover stands to use for weaned calves. In 2009 excess hay harvested from the fescue/clover field after grazing contained 14% CP and 59% TDN which is well above normal for that maturity of forage. The red clover forage provided quality forage that allowed the calves to be grazed an additional 60 after weaning resulting in an added value of \$92 per calf in 2010.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #2

1. Outcome Measures

Not Reporting on this Outcome Measure

of commercial forage producers who gained knowledge related to production practices

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	200	899

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

101 - Appraisal of Soil Resources

102 - Soil, Plant, Water, Nutrient Relationships

111 - Conservation and Efficient Use of Water

112 - Watershed Protection and Management

201 - Plant Genome, Genetics, and Genetic Mechanisms

203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants

204 - Plant Product Quality and Utility (Preharvest)

205 - Plant Management Systems

206 - Basic Plant Biology

213 - Weeds Affecting Plants

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure
of new Master Gardeners trained and certified

2. Associated Institution Types

- 1862 Extension
 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
 Change in Action Outcome Measure
 Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	700	412

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Building stronger leaders and stronger MG programs

The Master Gardener program continues to be a strong and vital program in Arkansas with continued interest in becoming a MG volunteer. Many counties are beginning to struggle to get volunteers to step up into a leadership role. Another concern is that as the program continues to grow--(62 county based programs and 3000 volunteers) management issues arise.

What has been done

The state MG advisory board has a committee whose mission is to plan and implement a leadership training. To encourage better participation statewide, funds were raised at the state MG convention earmarked for leadership. We were able to pay the registration fee for two Master Gardeners per county. We had over 100 in attendance at the two day event which was held at the Winthrop Rockefeller Institute. Topics ranged from conflict management to project selection and maintenance to how social media can benefit your program. Master Gardeners were encouraged to take this information back to their counties and implement it.

Results

Evaluations were outstanding regarding the usefulness of the material presented. Several counties have implemented changes in their programs and have developed tools to use in recruiting new Master Gardeners as well as leaders. Due to the successful program we have also seen a rise in membership in our state advisory board. A statewide Facebook account was begun to help share information. A garden blog has also had a strong following. Not only did this

event build the MG program in each county, but the Master Gardener volunteers who organized the event built strong tools for their own leadership abilities.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure

of commercial forage producers who changed or adopted a new forage management practice

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	65	95

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #5

1. Outcome Measures

- Not Reporting on this Outcome Measure

of non commercial participants who changed or adopted a new forage and/or grazing management practice

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #6

1. Outcome Measures

- Not Reporting on this Outcome Measure

of clientele using soil testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	8775	12985

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Surveys conducted by our research program indicate that golf course superintendents apply a high percentage of the total fertilization to their putting green turf as a foliar application, which is defined as nutrient absorption through the leaf tissue. Unfortunately, there have been no studies that have investigated the efficiency and efficacy of foliar uptake of nutrients in putting green turf, especially under field conditions. In addition, there have been no studies that have investigated potential loss mechanisms when applying nutrients in a foliar approach.

What has been done

We have conducted a range of research projects that have investigated the uptake efficiency and ammonia volatilization losses of foliar-applied nitrogen to both creeping bentgrass and hybrid

bermudagrass, the major turfgrass species used on putting greens in Arkansas. These studies have utilized isotopic nitrogen sources that can accurately trace both uptake efficiency and environmental loss.

Results

The results of these studies are the first to describe the uptake kinetics of foliar-applied nitrogen to golf course putting greens. These results have provided turfgrass managers with necessary information to integrate other cultural practices with a foliar nutrient application for both maximum efficiency and minimal environmental losses. These studies have demonstrated that foliar applications of nitrogen experience minimal environmental loss, suggesting that these approaches have great potential to minimize the environmental impact of nitrogen applications in a range of turfgrass situations. Finally, these studies have clearly shown that basic nitrogen sources such as urea or ammonia are absorbed as readily as more expensive nitrogen sources, which can greatly reduce fertilizer costs to golf course managers.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #7

1. Outcome Measures

- Not Reporting on this Outcome Measure
- # of clientele using plant testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	660	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Greenhouse and containerized nursery crops are grown in containers typically made from petroleum-based plastics. However, the extensive use of plastic containers has resulted in waste disposal problems. As the greenhouse and nursery industries become more focused on increasing the sustainability of their operations, the amount of waste plastics generated has become an issue. Although recycling of containers is an option in some situations, reducing the use of plastic containers by increasing the use of biocontainers is a strategy that could reduce the amount of waste plastic generated by greenhouses and nurseries.

What has been done

The physical properties of water use, strength, algal/fungal growth and decomposition were evaluated for ten types of biocontainers compared to traditional petroleum-based plastic containers. Physical properties varied significantly among the types of containers. In particular, Cowpot, peat and wood fiber biocontainers were found to have low wet strength that would be problematic for users. Peat, straw, cocofiber and wood fiber biocontainers required significantly more water to grow a crop to a marketable stage than other biocontainers as well as traditional plastic containers. Ricehull and OP47 biocontainers had physical properties similar to plastic containers. Trials were initiated to evaluate biocontainer performance when used for long-term greenhouse and containerized nursery crops.

Results

The information generated from this research will allow manufacturers to improve biocontainers and will end users to make decisions regarding which biocontainer(s) are most suitable for their operations. Ultimately, the results of this research will help to reduce the use of petroleum-based plastics in greenhouses and nurseries.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #8

1. Outcome Measures

Not Reporting on this Outcome Measure

of clientele using water testing

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	95	131

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The availability of adequate potable water in urban environments continues to be one of the most pressing issues facing developed nations. As populations become more urban, humans, agriculture, and industry are often competing for a finite water supply and landscape water use is often the last segment that is provided water. When these demands are coupled with potential climate change, intense droughts in many regions, and a continued migration of people into water-limited environments such as the desert southwest, the need to identify plants that can survive and thrive on limited water is paramount.

What has been done

Since 2005, we have worked closely with several private turfgrass breeders to screen and identify turfgrass cultivars that have improved drought tolerance and reduced water use. We have already conducted large scale trials using tall fescue, bluegrasses, perennial ryegrass, and bermudagrass. In the process, we have developed and fine-tuned a screening and statistical analysis method that allows a large number of turfgrasses to be screened efficiently and economically, such that the methods can be readily applied to other turfgrasses or landscape plants in the future.

Results

The results of these studies have already been recognized by turfgrass breeders and seed companies as a means to identify both superior breeding material in their genetic resources and to identify existing cultivars that can be marketed and sold for reduced water consumption. Several of these companies are developing branding programs that allow consumers a better opportunity to purchase turfgrasses with reduced water requirements. The success of the

program is also recognized by the adoption of this screening and statistical protocol by the National Turfgrass Evaluation Program, which is the preeminent program for testing turfgrass germplasm in the U.S. In addition, there is now interest from municipalities and water districts to utilize this information in the development of specifications for landscapes that require less water.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #9

1. Outcome Measures

- Not Reporting on this Outcome Measure

of clientele (non-duplicated) who use the DD50 program for improved rice production efficiency

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1800	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #10

1. Outcome Measures

- Not Reporting on this Outcome Measure
of impacted acres using the DD50 program for improved rice production efficiency

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	713500	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #11

1. Outcome Measures

- Not Reporting on this Outcome Measure
of clientele using RICESEED program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	260	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships

- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #12

1. Outcome Measures

- Not Reporting on this Outcome Measure
of acres planted based on output from RICESEED program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	56600	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #13

1. Outcome Measures

- Not Reporting on this Outcome Measure
- # of Master Gardeners who recertified

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	412

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Home Gardening is a growing commodity in Arkansas and generates volumes of calls in county offices statewide. Arkansas has had a strong volunteer program in the Master Gardener program and it continues to grow and strengthen. In addition, statewide public gardening events are on the increase. While we feel that extension programs are well known throughout the state there is always room for improvement. It is also important that university based information is readily available to all Arkansans in a quality package.

What has been done

Making sure materials used by county agents and Master Gardeners are of the highest quality, we have conducted numerous classes on PowerPoint, graphic design and digital photography across the state. These materials are then posted on the ftp site for all counties to use. In addition, a garden calendar was designed and printed by the Master Gardener program. These for sale publications are being used not only as a fund raiser, but also as a marketing tool. A photo contest was held statewide to choose the pictures for the calendar. Ten gardening tips per month are posted in the calendar and there is a listing of all county offices. The logo is on each

page of the calendar. We provided five free copies to each county office to use with their local leadership and made the calendars available to people statewide. The home and garden section of the extension website is the most popular site. In addition we started an Arkansas Master Gardener Facebook account and a garden blog. New display boards were designed and are available for use at fairs and trade shows statewide. An interactive gardening display was conducted at the 2010 Arkansas Flower & Garden Show.

Results

County Agents and Master Gardeners statewide have had easy access to quality PowerPoint programs that they have used in county programming. Over 1500 gardening calendars have gone out statewide. The display at the Arkansas Flower & Garden Show was one of the most popular sites at the show generating hundreds of questions on raised bed vegetable gardening, rain barrels and gardening in general. The "In the Garden" blog had over 22,000 readers just since May alone. With good communication we have seen events fill up quickly. Our state conference was full with 420 attendees and a waiting list to get in. The MG Study trip to Costa Rica filled up in less than two weeks of being announced.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #14

1. Outcome Measures

- Not Reporting on this Outcome Measure
- # of new horticultural businesses and new farmers markets

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The interest in buying locally grown agricultural products has grown tremendously in the US and is reflected in the increasing number of farmers market across the US. Consumers are more concerned with the quality of the produce and environmental impact of shipping goods from producers thousands of miles away. When cut flowers are shipped a long distance before reaching consumers, freshness and quality are often sacrificed during long-distance shipping. Buying produce directly from local farmers and growers reduces 'produce mileage' (the distance that produce travels)/ carbon footprint, which in turn decreases global environmental pollution.

What has been done

Because of the increasing acceptance and demand for locally grown specialty cut flower products in the regional and national markets, there has been an increasing demand for workshops and educational materials to support this expanding market. To be efficient with limited resources, a group of University collaborators and an industry group, have joined forces to respond to this increasing demand for information and support.

Results

Collaborative efforts are focused on production and marketing risks emphasizing the transition to new production systems. The team targeted potential and existing specialty cut flower growers in the Mid-South. The project impacted grower knowledge through a regional two-day grower workshop, an indexed resource manual, an extension fact sheet, and electronic resources in specialty cut flower production and marketing.

The workshop was attended by 95 people from 23 states. The overall project goal increased knowledge and skills of current/potential specialty cut flower growers, university faculty, and other agricultural professionals and industry influencers in the topic of specialty cut flower production and marketing. As a result of participating in this project growers are in a better position to manage overall production and price risks. Feedback from a post-workshop survey indicated that:

- 32% changed or used a new marketing strategy
- 24% joined a professional or trade organization
- 92% networked with other growers
- 44% consulted with outside experts (e.g. lawyer, accountant, grower consultant)
- 52% changed my crop schedule or operation practices
- 16% started a cut flower business
- 56% diversified my products or services
- 48% enhanced my business pricing and/or record keeping processes
- 36% adopted a new production technique
- 52% adopted new cut flower crops

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #15

1. Outcome Measures

- Not Reporting on this Outcome Measure
Acres of harvested wheat (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	570000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water

- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #16

1. Outcome Measures

- Not Reporting on this Outcome Measure
Yield (bushels per acre) of harvested wheat (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #17

1. Outcome Measures

- Not Reporting on this Outcome Measure
Acres of harvested soybeans (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2890000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)

- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #18

1. Outcome Measures

- Not Reporting on this Outcome Measure
Yield (bushels per acre) of harvested soybeans

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	38	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology

- 213 - Weeds Affecting Plants

Outcome #19

1. Outcome Measures

- Not Reporting on this Outcome Measure
Acres of harvested rice (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1455000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #20

1. Outcome Measures

- Not Reporting on this Outcome Measure

Yield (pounds per acre) of harvested rice (all)

2. Associated Institution Types

- 1862 Extension
 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
 Change in Action Outcome Measure
 Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6610	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
 102 - Soil, Plant, Water, Nutrient Relationships
 111 - Conservation and Efficient Use of Water
 112 - Watershed Protection and Management
 201 - Plant Genome, Genetics, and Genetic Mechanisms
 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
 204 - Plant Product Quality and Utility (Preharvest)
 205 - Plant Management Systems
 206 - Basic Plant Biology
 213 - Weeds Affecting Plants

Outcome #21

1. Outcome Measures

Not Reporting on this Outcome Measure

Acres of harvested cotton (all)

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500000	642000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The cotton crop suffers from heat and drought stress which results in lost yield and lower fiber quality. For example, the ideal temperature range for cotton is from 68 to 86oF, whereas the average daily maximum temperatures during mid-season in Arkansas are always above this optimum. Also, even though a large percentage of the cotton acres are irrigated, they still suffer from water shortages during hot days, resulting in lost yield. This has led to a need to determine methods of ameliorating crop stress in order to achieve yield potentials. One such method is by the use of plant growth regulators (PGRs).

What has been done

We have evaluated the available PGRs for many years, but with recent insight into the mechanisms of plant response to stress, we have been able to focus on PGRs that would have a beneficial effect under stress conditions. One such PGR is 1-Methylcyclopropene, which blocks the attachment of the stress hormone ethylene and by so doing delays stress or prevents mild stress effects under high temperature or water stress. We have tested this PGR in field and growth room studies for several years, and determined its mechanism and how best to use it

Results

Use of 1-MCP to field grown cotton has shown a decrease in the effects of stress (manifested in increased antioxidant enzyme activity and decreased chlorophyll fluorescence) and a benefit in yield. This research has been nationally and internationally recognized as evidenced by invitations to speak at the Plant Growth Regulator Society of America (Jul 2011) and numerous requests for information on this product from Extension, consultants and Industry, and offers of sponsorship for continued research on similar compounds from major companies. My Plant

Growth Regulator program continues to supply a service to Arkansas by evaluating available PGRs and making the results available to farmers and extension

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #22

1. Outcome Measures

- Not Reporting on this Outcome Measure
Total yield (lbs) of harvested cotton

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	916	1200000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Input costs involved with cotton production continue to increase exponentially from year to year. More specifically seed costs have increased to record highs. One bag of cotton seed fifteen years ago would cost approximately \$80.00 per bag. With introductions of new technologies and seed treatments a bag of cotton seed in 2010 cost approximately \$550.00 per bag. The result is approximately \$100 to \$120.00 per acre for seed. This ranks planting as the most expensive application during a cotton season.

What has been done

In 2008-2010 a proposal was submitted and funded by the Cotton Incorporated Grower Support Committee to determine if optimal seeding rates could be identified for individual soil types or points of interest across a cotton field. The research was conducted on three farms in Southeast, Central and Northeast Arkansas. Soil variability was determined and separated by soil type through electrical conductivity measurements. Soil electrical conductivity (SEC) zones were generated using a Veris 3100 mobile electrical conductivity cart. Seeding rates ranging from 25,000 to 68,000 were evaluated spatially for each soil type across the field. Fields were harvest with yield monitors and data was analyzed spatially for each seeding rate.

Results

Preliminary results of the study indicate that higher seeding rates were required in heavier soil types to acquire an even stand, while sandy soil textures required less seed. Based on these results, five fields consisting of 430 acres were planted with variable rate planters in 2010. Seeding rates in these fields ranged from 27,000 seeds/A on sandy areas to 50,000 seeds/A on heavy clay areas of the field. Even stands were achieved on all fields and the average seeding costs were reduced approximately 25% or \$20.00 per acre. If we consider that there is at least 200,000 acres of fields that contain enough variability for this technology to apply, the savings in seed cost could reach a minimum of \$4.0 million dollars.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #23

1. Outcome Measures

- Not Reporting on this Outcome Measure
Acres harvested of hay (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1340000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

Outcome #24

1. Outcome Measures

- Not Reporting on this Outcome Measure
Yield (tons)of harvested hay (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 206 - Basic Plant Biology
- 213 - Weeds Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Response to NIFA Focus Areas)

Brief Explanation

Effort and expenditures previously reported to Plant and Plant Products were shifted to Global Food Security and Hunger in response to NIFA's Focus Areas.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other ()

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Technology & Engineering

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management				
141	Air Resource Protection and Management				
205	Plant Management Systems				
401	Structures, Facilities, and General Purpose Farm Supplies				
402	Engineering Systems and Equipment				
403	Waste Disposal, Recycling, and Reuse				
404	Instrumentation and Control Systems				
405	Drainage and Irrigation Systems and Facilities				
511	New and Improved Non-Food Products and Processes				
512	Quality Maintenance in Storing and Marketing Non-Food Products				
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures				
	Total				

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	4.5	0.0	3.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

For FY2010, this Planned Program will be reported to Global Food Security and Hunger.

2. Brief description of the target audience

For FY2010, this Planned Program will be reported to Global Food Security and Hunger.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	1200	10	5
Actual	0	0	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan: 9
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Plan	2	17	
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of on-farm demonstrations related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	20	0

Output #2

Output Measure

- # of cooperators involved in on-farm demonstrations related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10	0

Output #3

Output Measure

- # of field tours related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	5	0

Output #4

Output Measure

- # attending field tours related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	100	0

Output #5

Output Measure

- # of educational meetings related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	30	0

Output #6

Output Measure

- # of publications related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	19	0

Output #7

Output Measure

- # of hits on web site related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	100	0

Output #8

Output Measure

- # of farm visits or one-on-one consultations related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	20	0

Output #9

Output Measure

- # of grants/contracts written related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	10	0

Output #10

Output Measure

- # of grants/contracts funded related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	3	0

Output #11

Output Measure

- \$ amount of grants/contracts received related to technology and engineering.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	150000	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	# of people who increased their knowledge about technology and engineering.
2	# of people who adopted or implemented a recommendation about technology and engineering.
3	Acres associated with adopted or implemented recommendations related to technology and engineering.
4	# of counties with energy potential from bio-based sources assessments completed.
5	# of studies completed documenting the application of geospatial technologies for energy crops.
6	# of watersheds for which geospatial simulation studies are completed.
7	# of manure samples submitted by clientele for analysis by UofA.
8	# of poultry litter samples submitted by clientele for analysis by UofA.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

Not Reporting on this Outcome Measure

of people who increased their knowledge about technology and engineering.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1050	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 112 - Watershed Protection and Management
- 141 - Air Resource Protection and Management
- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 511 - New and Improved Non-Food Products and Processes
- 512 - Quality Maintenance in Storing and Marketing Non-Food Products
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and

Outcome #2

1. Outcome Measures

Not Reporting on this Outcome Measure

of people who adopted or implemented a recommendation about technology and engineering.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	110	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 112 - Watershed Protection and Management
- 141 - Air Resource Protection and Management
- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 511 - New and Improved Non-Food Products and Processes
- 512 - Quality Maintenance in Storing and Marketing Non-Food Products
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure

Acres associated with adopted or implemented recommendations related to technology and engineering.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 112 - Watershed Protection and Management
- 141 - Air Resource Protection and Management
- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 511 - New and Improved Non-Food Products and Processes
- 512 - Quality Maintenance in Storing and Marketing Non-Food Products
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and

Outcome #4

1. Outcome Measures

Not Reporting on this Outcome Measure

of counties with energy potential from bio-based sources assessments completed.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 112 - Watershed Protection and Management
- 141 - Air Resource Protection and Management
- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 511 - New and Improved Non-Food Products and Processes
- 512 - Quality Maintenance in Storing and Marketing Non-Food Products
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and

Outcome #5

1. Outcome Measures

Not Reporting on this Outcome Measure

of studies completed documenting the application of geospatial technologies for energy crops.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 112 - Watershed Protection and Management
- 141 - Air Resource Protection and Management
- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 511 - New and Improved Non-Food Products and Processes
- 512 - Quality Maintenance in Storing and Marketing Non-Food Products
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and

Outcome #6

1. Outcome Measures

Not Reporting on this Outcome Measure

of watersheds for which geospatial simulation studies are completed.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	2	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 112 - Watershed Protection and Management
- 141 - Air Resource Protection and Management
- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 511 - New and Improved Non-Food Products and Processes
- 512 - Quality Maintenance in Storing and Marketing Non-Food Products
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and

Outcome #7

1. Outcome Measures

Not Reporting on this Outcome Measure

of manure samples submitted by clientele for analysis by UofA.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 112 - Watershed Protection and Management
- 141 - Air Resource Protection and Management
- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 511 - New and Improved Non-Food Products and Processes
- 512 - Quality Maintenance in Storing and Marketing Non-Food Products
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and

Outcome #8

1. Outcome Measures

Not Reporting on this Outcome Measure

of poultry litter samples submitted by clientele for analysis by UofA.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	50	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 112 - Watershed Protection and Management
- 141 - Air Resource Protection and Management
- 205 - Plant Management Systems
- 401 - Structures, Facilities, and General Purpose Farm Supplies
- 402 - Engineering Systems and Equipment
- 403 - Waste Disposal, Recycling, and Reuse
- 404 - Instrumentation and Control Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 511 - New and Improved Non-Food Products and Processes
- 512 - Quality Maintenance in Storing and Marketing Non-Food Products
- 804 - Human Environmental Issues Concerning Apparel, Textiles, and Residential and

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other

Brief Explanation

For FY2010, this Planned Program will be reported to Global Food Security and Hunger.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

For FY2010, this Planned Program will be reported to Global Food Security and Hunger.

Key Items of Evaluation

For FY2010, this Planned Program will be reported to Global Food Security and Hunger.

V(A). Planned Program (Summary)

Program # 11

1. Name of the Planned Program

Climate Change

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	0%		10%	
102	Soil, Plant, Water, Nutrient Relationships	0%		10%	
111	Conservation and Efficient Use of Water	0%		15%	
112	Watershed Protection and Management	0%		10%	
131	Alternative Uses of Land	0%		5%	
132	Weather and Climate	0%		10%	
136	Conservation of Biological Diversity	0%		10%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		5%	
205	Plant Management Systems	0%		10%	
405	Drainage and Irrigation Systems and Facilities	0%		5%	
605	Natural Resource and Environmental Economics	0%		5%	
	Total	0%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	0.0	0.0	1.5	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	29948	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	30369	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	510437	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Basic and applied research to explore greenhouse gas emission processes in row crop agriculture.

2. Brief description of the target audience

Policy makers (USDA, USEPA, USDOE), supply chain managers (consumer package goods, WalMart, Kroger, Safeway).

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
Actual	8000	500	0	0

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
------	-----------	----------	-------

Actual	0	0	0
---------------	---	---	---

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Publications

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	3

Output #2

Output Measure

- Funded research amounts (in dollars).

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	350000

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Global Warming and High Temperature Stress in Cotton
2	Improving High Temperature Tolerance in Cotton
3	Amelioration of Stress in the Cotton Crop

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

- Not Reporting on this Outcome Measure
Global Warming and High Temperature Stress in Cotton

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Global warming has focused attention on the need for improved understanding of crop responses to heat stress. There is a negative correlation between high temperature and yield in cotton. This is particularly prevalent during the flowering early boll development resulting in lowered yields and unpredictable year-to-year yield variability.

What has been done

Field and controlled environment studies have quantified the effect of high temperature on the growth and yield development. The thresholds for heat stress on physiological parameters were established and the mode of action of the stress determined. Heat stress affects the carbohydrate supply from the leaf to the flower, and also lowers the energy status in the flower, which decreases pollen tube growth and decreases seed fertilization. The cotton plant has an antioxidant enzyme system which helps to ameliorate the heat stress, but this is limited in current commercial cultivars.

Results

This research on high temperature stress in cotton has explained the yield variability experienced by Arkansas farmers by biochemical changes occurring in the flowers that decreases the number of developing seeds in the ovary. This has allowed us to: (a) predict from weather data when heat stress will affect reproductive growth and subsequent yields, and (b) formulate and start testing methods of amelioration of the heat stress as well as on collaborative work with the plant breeder to select for thermotolerance. In addition, this work has led to invited talks at national meetings to share our findings, and the use of our parameters by people in the cotton industry to predict the effect of the weather on cotton yields in order to better forecast when to sell cotton on

the futures market.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 136 - Conservation of Biological Diversity
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 605 - Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

- Not Reporting on this Outcome Measure
Improving High Temperature Tolerance in Cotton

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Cotton originates in hot climates but does not necessary yield best at high temperatures. There is a negative correlation between high temperature and yield in cotton. The ideal temperature range for cotton is reported to be from 68 to 86oF. However, average daily maximum temperatures

during early boll development in Arkansas are almost always above 95°F, well above the optimum for photosynthesis and reproductive development. This is considered a major reason for lowered and variable yields experienced in cotton production. Current commercial varieties in cotton are susceptible to heat stress resulting in lowered yields and poorer fiber quality. There is an urgent need to determine methods of selecting for thermotolerance and screen available germplasm for thermotolerance.

What has been done

Growth room and field studies have evaluated techniques for quantifying high temperature response and the ability to tolerate these extremes. Our earlier research established the temperature thresholds for successful photosynthesis and reproductive development. In this study we evaluated various physiological and biochemical methods to accurately and reliably detect plant response to high temperature. We selected two measurements: chlorophyll fluorescence and membrane leakage as the best indicators of plant response to high temperature stress. We also developed and tested techniques of how to determine heat tolerance, i.e. by imposing heat stress, measuring plant response, and then removing the temperature stress to determine the plants ability to recover. This information was used to screen lines from the Arkansas breeding material as well as wildtypes for temperature tolerance.

Results

This research has provided the Cotton Plant Breeder with information for screening and selecting for temperature tolerance. This study is on-going. This research also discovered the physiological mechanisms of how thermotolerant cultivars, i.e. from hot countries such as Pakistan where cotton is regularly grown at temperatures above 100°F, tolerate heat.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 136 - Conservation of Biological Diversity
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 605 - Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure
Amelioration of Stress in the Cotton Crop

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The cotton crop suffers from heat and drought stress which results in lost yield and lower fiber quality. For example, the ideal temperature range for cotton is from 68 to 86oF, whereas the average daily maximum temperatures during mid-season in Arkansas are always above this optimum. Also, even though a large percentage of the cotton acres are irrigated, they still suffer from water shortages during hot days, resulting in lost yield. This has led to a need to determine methods of ameliorating crop stress in order to achieve yield potentials. One such method is by the use of plant growth regulators (PGRs).

What has been done

We have evaluated the available PGRs for many years, but with recent insight into the mechanisms of plant response to stress, we have been able to focus on PGRs that would have a beneficial effect under stress conditions. One such PGR is 1-Methylcyclopropene, which blocks the attachment of the stress hormone ethylene and by so doing delays stress or prevents mild stress effects under high temperature or water stress. We have tested this PGR in field and growth room studies for several years, and determined its mechanism and how best to use it.

Results

Use of 1-MCP to field grown cotton has shown a decrease in the effects of stress (manifested in increased antioxidant enzyme activity and decreased chlorophyll fluorescence) and a benefit in yield. This research has been nationally and internationally recognized as evidenced by invitations to speak at the Plant Growth Regulator Society of America (Jul 2011) and numerous requests for information on this product from Extension, consultants and Industry, and offers of sponsorship for continued research on similar compounds from major companies. My Plant Growth Regulator program continues to supply a service to Arkansas by evaluating available PGRs and making the results available to farmers and extension.

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water

- 112 - Watershed Protection and Management
- 131 - Alternative Uses of Land
- 132 - Weather and Climate
- 136 - Conservation of Biological Diversity
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 205 - Plant Management Systems
- 405 - Drainage and Irrigation Systems and Facilities
- 605 - Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Global Climate Change)

Brief Explanation

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing

different levels of program intensity.

- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Sustainable Energy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%		0%	
102	Soil, Plant, Water, Nutrient Relationships	10%		0%	
123	Management and Sustainability of Forest Resources	25%		0%	
131	Alternative Uses of Land	10%		0%	
202	Plant Genetic Resources	10%		0%	
204	Plant Product Quality and Utility (Preharvest)	10%		0%	
402	Engineering Systems and Equipment	10%		0%	
601	Economics of Agricultural Production and Farm Management	5%		0%	
605	Natural Resource and Environmental Economics	10%		0%	
	Total	100%		0%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	5.2	0.0	0.0	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
64555	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
85668	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
584387	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Develop educational materials, curriculum, & resources
- Workshops
- Field Days
- Demonstrations
- News Articles
- Newsletters
- Web-based Education
- Continuing Education
- Lab and Field Research

2. Brief description of the target audience

- Youth
- Agri Business
- Row Crop Agricultural Producers
- Consultants
- Forest Landowner Groups
- Forest Industry
- Loggers
- Natural Resource Professionals
- Landowners
- Educators
- Agency personnel
- Livestock producers
- Watershed and other Not-for-profit organizations
- General public
- Researchers
- Policy makers
- Research funding personnel and agencies

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
Actual	2654	1708	366	16

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan:
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	2	4	6

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational events held related to sustainable energy

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	204

Output #2

Output Measure

- Number of sustainable energy field demonstrations.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	6

Output #3

Output Measure

- Number of field days related to sustainable energy.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	17

Output #4

Output Measure

- Number of educational materials & curriculum developed and/or delivered.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	5

Output #5

Output Measure

- Number of sustainable energy events for row crop producers.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	2

Output #6

Output Measure

- Number of sustainable energy events for livestock producers.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	1

Output #7

Output Measure

- Percentage of farmers using biofuel in their farm equipment.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	0

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of landowners indicating an increased understanding of sustainable energy.
2	Number of locations for bioenergy crop demonstrations and research fields.
3	Economic value of bio-based fuels produced.
4	Diversification of bioenergy crops.

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of landowners indicating an increased understanding of sustainable energy.

2. Associated Institution Types

- 1862 Extension
 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
 Change in Action Outcome Measure
 Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
 102 - Soil, Plant, Water, Nutrient Relationships
 123 - Management and Sustainability of Forest Resources
 131 - Alternative Uses of Land
 202 - Plant Genetic Resources
 204 - Plant Product Quality and Utility (Preharvest)
 402 - Engineering Systems and Equipment
 601 - Economics of Agricultural Production and Farm Management
 605 - Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of locations for bioenergy crop demonstrations and research fields.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

101 - Appraisal of Soil Resources

102 - Soil, Plant, Water, Nutrient Relationships

123 - Management and Sustainability of Forest Resources

131 - Alternative Uses of Land

202 - Plant Genetic Resources

204 - Plant Product Quality and Utility (Preharvest)

402 - Engineering Systems and Equipment

601 - Economics of Agricultural Production and Farm Management

605 - Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure
Economic value of bio-based fuels produced.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 402 - Engineering Systems and Equipment
- 601 - Economics of Agricultural Production and Farm Management
- 605 - Natural Resource and Environmental Economics

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure
Diversification of bioenergy crops.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agriculture producers are not prepared to deal with the challenges posed by energy crops. Issues from planting to harvest are unknown and unstudied under Arkansas conditions. With increased interest and demand for energy feedstocks Arkansas growers are seeking answers. Research has been conducted related to cropping systems for high oil soybeans, Canada grass, switchgrass, sweet sorghum, hybrid poplar, and elephant grass (miscanthus).

What has been done

Results

4. Associated Knowledge Areas

- 101 - Appraisal of Soil Resources
- 102 - Soil, Plant, Water, Nutrient Relationships
- 123 - Management and Sustainability of Forest Resources
- 131 - Alternative Uses of Land
- 202 - Plant Genetic Resources
- 204 - Plant Product Quality and Utility (Preharvest)
- 402 - Engineering Systems and Equipment
- 601 - Economics of Agricultural Production and Farm Management

- 605 - Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Emerging Technologies)

Brief Explanation

Sustainable energy crops are easily impacted by external forces beyond our control. These diverse external factors can include changes in the economy, markets for other energy sources, shifts in public policy, and technology. Relatively new program area efforts continue with future expected outcomes.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other (Economic Models)

Evaluation Results

Programs in sustainable energy are relatively new, therefore the evaluation process is in its early stages. For example, field demonstrations indicate that the technological processes for developing sustainable energy through biomass sources exists, however, the economy viability is unknown.

Key Items of Evaluation

The UA Division of Agriculture Experiment Station received a 1.9 million dollar multi-state DOE grant in 2009 to develop bioenergy programs. This includes oil seed crops for biodiesel and biomass crops for ethanol and syngas production.

V(A). Planned Program (Summary)

Program # 13

1. Name of the Planned Program

Food Safety

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
403	Waste Disposal, Recycling, and Reuse	0%		5%	
501	New and Improved Food Processing Technologies	0%		25%	
502	New and Improved Food Products	2%		10%	
503	Quality Maintenance in Storing and Marketing Food Products	15%		5%	
504	Home and Commercial Food Service	33%		5%	
702	Requirements and Function of Nutrients and Other Food Components	10%		10%	
703	Nutrition Education and Behavior	15%		5%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%		25%	
724	Healthy Lifestyle	15%		10%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	3.6	0.0	18.4	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
44927	0	524721	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
59620	0	532114	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
406702	0	8408076	0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

The Division of Agriculture faculty and staff will develop, evaluate and disseminate education and curricula incorporating research and teaching.

Programs include:

- Quarterly HACCP Roundtable meeting
- Food safety and preservation workshops
- Better Process Control School
- Labeling workshop
- ServSafe workshops

Online distance education in food safety and manufacturing

Assistance to small food companies and entrepreneurs in the form of services, workshops, and consulting

Research

Research activities in food safety include work to improve food processing systems to minimize food pathogens and to improve detection systems for Listeria, Salmonella and other major food pathogens.

2. Brief description of the target audience

Audiences include, but are not limited to:

- Food Companies
- Entrepreneurs and restaurants
- Food service employees and/or food handlers
- Employers and employees
- School personnel
- Child care providers
- Youth, adults, and seniors

V(E). Planned Program (Outputs)**1. Standard output measures**

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
Actual	2776	33102	84386	1590

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan:
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	20	20

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of participants in educational programs leading to certification for food handlers (ServSafe and Better Process Control School).
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	259

Output #2

Output Measure

- Number of participants in quarterly HACCP roundtables.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	97

Output #3

Output Measure

- Number of ServSafe classes offered.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	18

Output #4

Output Measure

- Number of Food, Nutrition, and Health clientele from education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational methods.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	2494

Output #5

Output Measure

- Number of Food, Nutrition, and Health education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational events.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	769

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants who indicated that they increased their knowledge related to food, nutrition, and health following an educational class, seminar or workshop.
2	Number of participants receiving certification in Better Process Control, Culinary Scientist, and ServSafe.
3	Number of participants who adopted positive nutrition practices.
4	Number of participants who indicate that they intend to adopt one or more healthy food nutrition practices.
5	Consumer perceptions impact the demand for organic foods at farmers' markets
6	Impact of sanitation of deli slicers on foodborne illness
7	Foodborne Salmonella Typhimurium Survival and Virulence Expression during Food Processing

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of participants who indicated that they increased their knowledge related to food, nutrition, and health following an educational class, seminar or workshop.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	9163

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 403 - Waste Disposal, Recycling, and Reuse
- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 504 - Home and Commercial Food Service
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle

Outcome #2

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of participants receiving certification in Better Process Control, Culinary Scientist, and ServSafe.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	154

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 403 - Waste Disposal, Recycling, and Reuse
- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 504 - Home and Commercial Food Service
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle

Outcome #3

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of participants who adopted positive nutrition practices.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	7010

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 403 - Waste Disposal, Recycling, and Reuse
- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 504 - Home and Commercial Food Service
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle

Outcome #4

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of participants who indicate that they intend to adopt one or more healthy food nutrition practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 403 - Waste Disposal, Recycling, and Reuse
- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 504 - Home and Commercial Food Service
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle

Outcome #5

1. Outcome Measures

Not Reporting on this Outcome Measure

Consumer perceptions impact the demand for organic foods at farmers' markets

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	400

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Growth in sales of organic and all natural foods have been increasing at an astonishing 3 to 7 times the growth of every other conventional food category. Organic food and beverage sales represented approximately 4 percent of overall food and beverage sales in 2009 according to the Organic Trade Association's 2010 Organic Industry Survey. According to this same survey US sales of organic foods have grown from \$1 billion in 1990 to almost \$25 billion in 2009. Reports from the literature have shown that Consumers perceive organic foods are safer because they don't contain "harmful chemicals" and are more nutritious and higher quality than their conventional counterparts. Administrators of farmers' markets in Arkansas were interested in whether shoppers at their markets would be interested in purchasing organic foods at their farmers' markets.

What has been done

To answer this question, we surveyed more than 300 consumers at three farmers' market locations in Northwest Arkansas: Fayetteville, Springdale and Eureka Springs.

Results

Only 42% of those surveyed purchased most of their organic foods at farmers' markets, and 80% surveyed answered "yes" that they would buy more organic if its price was similar to that of conventional foods. We also surveyed these shoppers as to their concerns and beliefs about safer foods. The largest category (36%) said their major reason for shopping at farmers' markets was that they wanted their food to be free from chemicals, with pesticides being the biggest safety concern of 45% of the respondents. Only 2-6% of respondents were concerned about presence of harmful bacteria on their food. An overwhelming majority of the respondents (76%) believed

that organic foods are inherently safer than conventional. We repeated these surveys with consumers at three metropolitan farmers markets in Little Rock, Hot Springs and Texarkana. A majority of these shoppers (71%) also believed organic foods were safer than conventional foods. Surprisingly, three times as many patrons in southern Arkansas were concerned about harmful bacteria in conventional foods than organic. The number one reason for shopping at farmers' markets was to support local farmers. Clearly, there is a considerable individual difference among perception and the potential for food safety problems. Therefore, an immediate need exists to develop applicable interventions for organic food and poultry processing.

4. Associated Knowledge Areas

- 403 - Waste Disposal, Recycling, and Reuse
- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 504 - Home and Commercial Food Service
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle

Outcome #6

1. Outcome Measures

- Not Reporting on this Outcome Measure
Impact of sanitation of deli slicers on foodborne illness

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Listeria monocytogenes causes a rare but potentially fatal disease, listeriosis. The mortality rate from this disease is approximately 28%, particularly in immunocompromised individuals, who are most at risk. The economic burden for US citizens for a single case of listeriosis is estimated to be \$1,659,143. *L. monocytogenes* has been strongly linked to the consumption of deli foods and meats sliced in the deli. It has been apparent for many years that meat slicers in retail establishments can harbor large populations of bacteria and some of the pathogenic bacteria have the potential to cross contaminate sliced, ready-to-eat foods.

What has been done

Various methods of cleaning and sanitizing the deli slicer were evaluated as were different cleaners and sanitizers.

Results

Dry thermal treatment at 80 degrees C and times up to 15 h are not sufficient to achieve a 5-log reduction of residual *Listeria* that may have survived improper cleaning and sanitizing of the deli slicer. However, a three-hour treatment at 80 degrees C produced a 2 or 3 log reduction, which would likely be adequate for a machine that had been cleaned and sanitized prior to heating. Dry thermal heating overnight could provide an extra hurdle for *Listeria* contamination in the worst case scenario of an inadequately cleaned and sanitized slicer. Barrier II, a commonly used sanitizer in deli's was found to be a good sanitizer, used with a common white bar towel. Sanitation wipes, which are used in many deli's to wipe slicer blades between slicing, were found to be inadequate.

4. Associated Knowledge Areas

- 403 - Waste Disposal, Recycling, and Reuse
- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 504 - Home and Commercial Food Service
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle

Outcome #7

1. Outcome Measures

- Not Reporting on this Outcome Measure
Foodborne Salmonella Typhimurium Survival and Virulence Expression during Food Processing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Salmonellosis is one of the most common foodborne diseases in the United States. Given that Salmonella can originate from a wide variety of food production environments, reduction of this organism at all stages of food production is critical. This project has three components designed to address this problem. Our specific research program goal reflects an integrated approach for controlling Salmonella spp. and other foodborne pathogens at all stages of food production. The relative incidence of Salmonella spp. foodborne disease continues, despite the growing body of information regarding the most common contamination routes. During its life cycle Salmonella enterica serotype Typhimurium can encounter various environmental stress conditions which may have dramatic effect(s) on its survival and virulence. Although there is considerable information regarding environmental signals that control growth and pathogenesis in animals and humans, little is known about the biology of Salmonella during food processing. Research is needed to determine the environmental factors that are critical for survival of this pathogen and therefore must be modified to prevent the early establishment of Salmonella in food processing environments and virulence expression under these conditions.

What has been done

Our current food production Salmonella spp. research projects have emphasized studies on the growth, survival and pathogenesis of the organism under conditions encountered during poultry processing. However, the success of Salmonella spp. in becoming re-established in the gastrointestinal tract of food animals during certain phases of processing indicates that Salmonella spp. can competitively interact with the dynamics of the food matrix. Based on these observations, our research is focused on salmonellae metabolism and genetic regulation of stress responses when grown under processing conditions and determines how these overlap with expression of virulence when foodborne Salmonella spp. become pathogenic.

Results

The outcome of this research has implications not only for persistence of foodborne salmonellae in processing, but raises practical issues regarding the choices of antimicrobials as intervention steps in processing. Issues we are now pursuing include whether thermal treatment predisposes salmonellae to be more resistant to particular antimicrobials and how these conditions might influence virulence and pathogenic characteristics of salmonellae. Molecular techniques will delineate some of the phenotypic responses we have observed thus far and examine virulence expression of Salmonella under typical food production and processing conditions.

4. Associated Knowledge Areas

- 403 - Waste Disposal, Recycling, and Reuse
- 501 - New and Improved Food Processing Technologies
- 502 - New and Improved Food Products
- 503 - Quality Maintenance in Storing and Marketing Food Products
- 504 - Home and Commercial Food Service
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and
- 724 - Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other

Brief Explanation

External factors that impacted outcomes included the following: 1) Program realignment impacted efforts expended in several of the listed programs within the new Food Safety initiative; 2) Several state defined outcomes were moved from the Food, Nutrition, and Health State Planned Programs to the Food Safety Initiative; 3) The Food Preservation program was a relatively new focus after being dormant for many years. New programs materials were developed and trainings offered; 4) A reduction in staff (FTEs), which reduced the amount programming at the state level and in several counties, had a negative impact on program delivery for the Food Safety and Food Preservation component; 5) The economic downturn impeded the replacement of staff and the attainment of resources for program implementation; 6) Data not collected due to reporting and incorrect placement of state defined outcome.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

Growth in sales of organic and all natural foods have been increasing at an astonishing 3 to 7 times the growth of every other conventional food category. Reports from the literature have shown that Consumers perceive organic foods are safer because they don't contain "harmful chemicals" and are more nutritious and higher quality than their conventional counterparts. Administrators of farmers' markets in Arkansas were interested in whether shoppers at their markets would be interested in purchasing organic foods at their farmers' markets. To answer this question, we surveyed more than 300 consumers at three farmers' market locations in Northwest Arkansas: Fayetteville, Springdale and Eureka Springs. Only 42% of those surveyed purchased most of their organic foods at farmers' markets, and 80% surveyed answered "yes" that they would buy more organic if its price was similar to that of conventional foods. We also surveyed these shoppers as to their concerns and beliefs about safer foods. The largest category (36%) said their major reason for shopping at farmers' markets was that they wanted their food to be free from chemicals, with pesticides being the biggest safety concern of 45% of the respondents. Only 2-6% of respondents were concerned about presence of harmful bacteria on their food. An overwhelming majority of the respondents (76%) believed that organic foods are inherently safer than conventional. We repeated these surveys with consumers at three metropolitan farmers markets in Little Rock, Hot Springs and Texarkana. A majority of these shoppers (71%) also believed organic foods were safer than conventional foods. Surprisingly, three times as many patrons in southern Arkansas were concerned about harmful bacteria in conventional foods than organic. The number one reason for shopping at farmers' markets was to support local farmers. Clearly, there is a considerable individual difference among perception and the potential for food safety problems. Therefore, an immediate need exists to develop applicable interventions for organic food and poultry processing.

Key Items of Evaluation

UA Cooperative Extension service in 33 counties partnered with 64 schools to teach children proper hand washing techniques. County Extension faculty utilized the Fight BAC curriculum and Germ City interactive walk-through exhibit to teach children what germs are and when, why, and how to wash their hands. In FY10, more than 14,600 contacts with

youth in grades pre-K through 9th grade provided 742 learning experiences on the importance of proper hand washing. More than 78% of youth participants reported they more often practice desirable personal hygiene such as hand washing after the Fight BAC and Germ City lessons.

In Sharp County, 915 students learned proper hand washing techniques through Fight Bac and Germ City classes.

One month later a first grade teacher from Cave City Elementary reported: I heard a kid in the bathroom this week signing the ABC song while scrubbing her hands. She'd remembered how long you are supposed to wash your hands and she was really trying to get them clean.

An administrator from Cherokee Elementary reported: I can tell the students are more cognizant of germs on their hands and how important it is to keep them clean. It is hard, of course, to always wash our hands here at school when we need to, but they are sure going through the hand sanitizer - more than before Germ City.

In Nevada County, 218 students learned to wash their hands properly using black-light sensitive "germ lotion". According to the school nurse, school absences decreased an average of 3.27 days after hand washing lessons compared to the previous year . "Hopefully, we will see a trend continue with absences decreasing as students remember to wash their hands frequently and correctly, decreasing the potential for illness which keeps them out of school." Lindsey Casey, school nurse.

V(A). Planned Program (Summary)

Program # 14

1. Name of the Planned Program

Childhood Obesity

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
502	New and Improved Food Products	0%		10%	
702	Requirements and Function of Nutrients and Other Food Components	10%		10%	
703	Nutrition Education and Behavior	30%		10%	
704	Nutrition and Hunger in the Population	15%		25%	
724	Healthy Lifestyle	25%		35%	
806	Youth Development	20%		10%	
	Total	100%		100%	

Add knowledge area

V(C). Planned Program (Inputs)

1. Actual amount of professional FTE/SYs expended this Program

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	29.4	0.0	2.3	0.0

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
367703	0	64244	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
487959	0	65149	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
3328636	0	798666	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Multisession as well as social marketing programs were conducted with a varied adult base. Curricula that incorporated research and emphasizing lifestyles were used to reach audiences with needs-based information. The University of Arkansas Division of Agriculture faculty designed and distributed educational resources that could be used with youth, adults, parents, grandparents, and collaborators.

Programs included:

- * Walk Across Arkansas youth
- * SNAP-ED
- * General Nutrition Education programs and activities
- * Living Well with Diabetes
- * Child Care Provider Training
- * Reshape Yourself

2. Brief description of the target audience

Audiences included but not limited to:

- * Youth
- * Teachers and school personnel
- * Parents
- * Adults
- * Grandparents
- * Child Care Providers
- * General Public
- * Federal and State Agency Employees

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
Actual	67545	337935	272696	8518

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010
 Plan:
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	2	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of grants written and funded in support of Food, Nutrition, and Health programming and research.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	40

Output #2

Output Measure

- Number of news articles, public service announcements, radio, and TV media programs in support of Food, Nutrition, and Health programs
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	1527

Output #3

Output Measure

- Number of non-duplicated Food, Nutrition, and Health 4-H Youth programs delivered.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	2195

Output #4

Output Measure

- Number of non-duplicated participants in Food, Nutrition, and Health 4-H Youth Programs.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	0

Output #5

Output Measure

- Number of Food, Nutrition, and Health in-service trainings conducted.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	6

Output #6

Output Measure

- Number of Federal grants and contracts.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	0

Output #7

Output Measure

- Number of Food, Nutrition, and Health clientele contacts from education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational methods.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	449645

Output #8

Output Measure

- Number of extension educators involved in discussions regarding public and organizational nutrition and health policies, regulations and industry practices.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	23

Output #9

Output Measure

- Number of Food, Nutrition, and Health education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational events.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	19434

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants who indicated that they increased their knowledge related to food, nutrition, and health following an educational class, seminar or workshop.
2	Number of individuals who increased physical activities as a result of completing an Extension program.
3	Number of participants who adopted positive nutrition practices
4	Number of participants reporting reduction in body weight after completing a nutrition education program.
5	Number of participants who indicate that they intend adopt one or more healthy food/nutrition practices.
6	Number of students involved in research focusing on overweight and obesity.
7	Number of participants reporting reduction in blood pressure after completing a nutrition education program
8	Number of participants reporting reduction in blood cholesterol after completing a nutrition education program
9	Number of participants reporting reduction in blood glucose after completing a nutrition education program
10	Parboiled rice is a good source of health promoting starch

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants who indicated that they increased their knowledge related to food, nutrition, and health following an educational class, seminar or workshop.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	14008

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #2

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of individuals who increased physical activities as a result of completing an Extension program.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	7101

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Obesity has reached epidemic proportions with over a third of the US population weighing in as obese (indicated by a BMI of 30 kg/m² or higher). Obesity increases the risk of mortality and many chronic diseases (i.e., heart disease, cancer, diabetes, etc) and other health problems (i.e., respiratory, gynecological, developmental, etc). Ultimately, obesity decreases a person's quality of life and overburdens the health care system, attributing up to \$1 Billion dollars in health care costs in Arkansas alone.

What has been done

Arkansas has responded to the obesity epidemic by encouraging Arkansans to move more. Walk Across Arkansas (WAA) is a statewide physical activity campaign and competition. It is offered twice per year, for 8 week increments with 8-person teams. Miles walked are counted using pedometers or conversion formulas (if other forms of activity are utilized). At the end of the program, teams with most miles and improvements, across various categories, receive prizes and are announced statewide.

Results

The Walk Across Program included 2,134 participants walking a total of 429,509 miles. Eighty-five percent (85%) of participants reported that the program helped them increase their physical activity. Participants reported improvement in health and well-being in terms of food habits, activity, energy, sleep, bloodwork, stress and relationships. Some surveys indicate that for every 1,000 steps taken (or half a mile), \$1 is saved in healthcare costs. This means that each Arkansan who participated in WAA had contributed to a potential healthcare savings of \$859,018 for the year of 2010.

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of participants who adopted positive nutrition practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	8370

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Over 18% of Arkansans live below the poverty line and can't afford enough food to eat. The number of Arkansans seeking food assistance is on the rise as families struggle to keep food on the table. Approximately 20% of the population receives Supplemental Nutrition Assistance Program (SNAP) benefits. The UACES SNAP-Ed program is designed to help SNAP participants, and people eligible to receive SNAP benefits, make healthy food choices, stretch their food resources and lead a physically active lifestyle.

What has been done

In all 75 counties, nutrition education classes and other activities were provided to SNAP participants through DHS offices, WIC Clinics, Head Start Schools, Housing Authorities, Food Pantries/Commodity Distribution Sites, eligible Public Schools, Senior Centers, and many other eligible sites.

Results

Based on surveys of adult participants (n=1,957):

*76% made one or more positive dietary change

*63% increased physical activity

*69% improved food safety procedures

*58% reported running out of food less often

*57% saved money on groceries

*74% (n= 275) decreased body weight

"One young father commented that he wanted to feed his children fruit, but he simply could not afford to spend 59 cents for an apple. After the program, he said he had learned ways he could serve fruit without spending as much money." FCS Agent, Logan County

Parent surveys were conducted in 12 counties to assess the impact of nutrition education for children on family behaviors (n= 1617):

*79% of children talked to their parents about healthy food and/or snacks.

*73% of children asked for more or different fruits, vegetables, milk or yogurt.

*62% of children talked to their parents about being more active.

*61% of parents had made changes in their family's eating and/or had been more physically active.

Parents reported they or their families made the following changes :

*87% eat more fruits and vegetables

*85% drink more water

*81% are more active

*78% eat more different fruits and vegetables

*75% eat more high-fiber/whole grain foods

*69% consume less sugary foods

*69% eat less high-fat or fried foods

*64% eat more low-fat or fat-free dairy foods

*64% consume less sugary beverages

"I like what you taught my kid at school today, because we had to go straight to the store and buy apples when he got home because he said he had to eat healthy."Parent, Fulton County

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants reporting reduction in body weight after completing a nutrition education program.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	171

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Excess weight in the form of body fat is linked to increased risk for cardiovascular disease, diabetes, certain types of cancer and other chronic diseases. In Arkansas, two-thirds of adults are overweight or obese. Research shows that even small decreases in weight can lower the risks for these chronic diseases. It is estimated that obesity may cost Arkansas over \$1 billion in health care costs and lost productivity annually. More than half the costs are paid by taxpayers via Medicare or Medicaid.

What has been done

The UACES offered the 15-week Reshape Yourself program in thirteen counties in FY10. Reshape Yourself supports the idea that people of all sizes and shapes can improve health by adopting healthy practices. Participants learn to plan balanced diets based on MyPyramid, balance calorie intake with calorie expenditure, read food labels, determine which foods are high in calories and fat, and find enjoyable ways to be physically active and many more ideas for maintaining a healthy weight.

Results

The Reshape Yourself program experienced a 76% graduation rate. The average weight loss per graduate was 11.8 pounds. The 227 graduates walked 40,128 miles and lost 2,674 pounds.

*90% of participants reported altering behavior to follow standard serving sizes

*86% of participants decreased body weight

*84% of participants reported an increase in walking activity

*58% of participants asked about or screened reported decreased blood pressure

*62% of participants asked about or screened reported decreased blood cholesterol

*57% of participants asked about or screened reported decreased blood glucose

*20% of participants asked about decreasing medication reported their doctor had reduced or eliminated prescribed medication as a result of lifestyle changes made

*Among those who reduced medications, an average of \$64 was saved per month which can lead to a yearly savings of \$768 per year per person. This has a potential cost savings of \$34,867 for the 20% of graduates who reduced medications.

**"When I joined Reshape Yourself I had never taken my blood pressure and was surprised to find that it was over the top. This was the reason I was feeling so terrible. My blood pressure is back to normal now. Reshape Yourself is a lifesaver!" Crawford County Reshape Yourself Participant

**"I decided that when I took this ReShape program that I was determined to stick with it. It has

changed a lot of things in my life that I otherwise would not do. I quit being a couch potato, and I got active again. I didn't meet my goal, by one pound, but I am still going to try and lose more. I am 20 pounds overweight according to the BMI, so I have more pounds to lose, but the ReShape program has got me on the right track. So thank you." Linda, Independence County Reshape Yourself Participant

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #5

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants who indicate that they intend adopt one or more healthy food/nutrition practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	9429

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #6

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of students involved in research focusing on overweight and obesity.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #7

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants reporting reduction in blood pressure after completing a nutrition education program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	60

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #8

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants reporting reduction in blood cholesterol after completing a nutrition education program

2. Associated Institution Types

- 1862 Extension
 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
 Change in Action Outcome Measure
 Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	56

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
 702 - Requirements and Function of Nutrients and Other Food Components
 703 - Nutrition Education and Behavior
 704 - Nutrition and Hunger in the Population
 724 - Healthy Lifestyle
 806 - Youth Development

Outcome #9

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of participants reporting reduction in blood glucose after completing a nutrition education program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	60

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #10

1. Outcome Measures

Not Reporting on this Outcome Measure

Parboiled rice is a good source of health promoting starch

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Obesity is a major public health concern affecting more than one-third of adults in the United States. The obesity rate in Arkansas is 30.5% for 2009. Obesity is associated with serious health conditions, including cardiovascular disease, hypertension, diabetes mellitus, and certain cancers. There is an increased interest from consumers in buying foods with purported health benefits. Research has shown that consuming low glycemic index food can be used in weight management and in the prevention and management of type II diabetes. Rice is one of the most important crops in the world, and Arkansas is the largest rice producing state in the U.S. accounting for over 50% U.S. rice production. Rice provides a major source of carbohydrates for many countries.

What has been done

Food science researchers at the University of Arkansas demonstrated that parboiled rice is a good source of health-promoting starch, i.e. slowly digestible starch and resistant starch. Resistant starch is the fraction of starch that resists digestion in the stomach and small intestine but is fermented in the large intestine. Recent research has shown that resistant starch can enhance the growth of health-promoting bacteria in the intestine, improve colonic function and bowel health, lower cholesterol and plasma triglyceride, and increase the use of stored fat. Both rice cultivar and parboiling process affect the amounts of health promoting starch content in parboiled rice. Autoclaving under pressure and storage treatments promoted the formation of slowly digestible starch and resistant starch and decreased the content of rapidly digestible starch in parboiled rice. Longer autoclaving duration aids in the disorganization of starch and promotes interactions among rice components to increase slowly digestible starch and resistant starch. Therefore, it is possible to increase slowly digestible starch and resistant starch in parboiled rice

by choosing rice cultivars and parboiling conditions that promote the formation of slowly digestible starch and resistant starch.

Results

This work demonstrates that the nutrition value of rice can be enhanced through parboiling processing to increase the slowly digestible starch and resistant starch content. With the current consumers becoming more health conscious, such product will be able to provide a wider market of nutraceutical and functional foods, and benefit consumers as a useful addition to conventional prevention and treatments for a range of health conditions. The findings from this research will enhance the marketability and increase the consumption of rice products. Arkansas rice farmers will be benefited as well through the diversified use of locally available agrobiological resource.

4. Associated Knowledge Areas

- 502 - New and Improved Food Products
- 702 - Requirements and Function of Nutrients and Other Food Components
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle
- 806 - Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other

Brief Explanation

External funding changes and a change in priority programming impacted the reporting efforts for several Food, Nutrition and Health programs. The economic downturn during the year impacted how programming resources were aligned; thus impacting the delivery of some programs. Additionally, a reduction in staff (FTEs) also had a negative impact on program delivery and reporting. Realigning priorities significantly impacted the outcomes...negatively and positively.

The downturn in the economy continued to increase the number of Arkansans receiving Supplemental Nutrition Assistance Program (SNAP) benefits thus increasing the need to target SNAP recipients.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

Several strategies will be initiated and utilized for collecting program assessment information to determine program results, outcomes and impacts. Extension educators will use a variety of recommended methods to gather needed information. Collection methodology and assessment tools will be programmatic and audience centered. Programs focusing on physical activity will use skill-based assessments, before-after program assessments, behavioral changes, observation, and questionnaires. Nutrition and health related activities will use anecdotal information, pre-test, post-test assessments and self-report of practice change. Unobtrusive means (request for additional information, purchase of video's and materials, increased participation and observation) will also be used to capture information.

Key Items of Evaluation

Arkansas has responded to the obesity epidemic by encouraging Arkansans to move more. Walk Across Arkansas (WAA) is a statewide physical activity campaign and competition. The Walk Across Program included 2,134 participants walking a total of 429,509 miles. Eighty-five percent (85%) of participants reported that the program helped them increase their physical activity. Participants reported improvement in health and well-being in terms of food habits, activity, energy, sleep, bloodwork, stress and relationships. Some surveys indicate that for every 1,000 steps taken (or half a mile), \$1 is saved in healthcare costs. This means that each Arkansan who participated in WAA had contributed to a potential healthcare savings of \$859,018 for the year of 2010.

In 75 Arkansas counties, nutrition education classes and other activities were provided to SNAP participants through DHS offices, WIC Clinics, Head Start Schools, Housing Authorities, Food Pantries/Commodity Distribution Sites, eligible Public Schools, Senior Centers, and many other eligible sites.

A survey conducted with SNAP adult participants (n=1,957) indicated the following:

76% made one or more positive dietary change

63% increased physical activity

69% improved food safety procedures

58% reported running out of food less often

57% saved money on groceries

74% (n= 275) decreased body weight

Parent surveys were conducted in 12 counties to assess the impact of nutrition education for children on family behaviors (n= 1617):

79% of children talked to their parents about healthy food and/or snacks.

73% of children asked for more or different fruits, vegetables, milk or yogurt.

62% of children talked to their parents about being more active.

61% of parents had made changes in their family's eating and/or had been more physically active.

V(A). Planned Program (Summary)**Program # 15****1. Name of the Planned Program**

Global Food Security and Hunger

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	5%		5%	
111	Conservation and Efficient Use of Water	5%		5%	
112	Watershed Protection and Management	5%		5%	
201	Plant Genome, Genetics, and Genetic Mechanisms	5%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	5%		5%	
204	Plant Product Quality and Utility (Preharvest)	5%		5%	
205	Plant Management Systems	5%		5%	
213	Weeds Affecting Plants	5%		5%	
215	Biological Control of Pests Affecting Plants	5%		5%	
301	Reproductive Performance of Animals	5%		5%	
302	Nutrient Utilization in Animals	5%		5%	
303	Genetic Improvement of Animals	5%		5%	
305	Animal Physiological Processes	5%		5%	
306	Environmental Stress in Animals	5%		5%	
307	Animal Management Systems	5%		5%	
308	Improved Animal Products (Before Harvest)	5%		5%	
311	Animal Diseases	5%		5%	
703	Nutrition Education and Behavior	5%		5%	
704	Nutrition and Hunger in the Population	5%		5%	
724	Healthy Lifestyle	5%		5%	
	Total	100%		100%	

Add knowledge area**V(C). Planned Program (Inputs)****1. Actual amount of professional FTE/SYs expended this Program**

Year: 2010	Extension		Research	
	1862	1890	1862	1890

Actual	76.9	0.0	75.1	0.0
--------	------	-----	------	-----

2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
961349	0	2704707	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1275755	0	2742834	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
8702627	0	37105832	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Division of Agriculture faculty developed, evaluated, and disseminated needs-based programs that focus on the reduction of food insecurity within vulnerable populations. The Expanded Food and Nutrition Education Program was conducted in eleven counties with a high percentage of Supplemental Nutrition Assistance program participants and Hispanic households. Program Assistants are used to conduct one-on-one and group training with individuals who fall within the parameters of the program. There is a series of eight lessons utilized by staff that focuses on food budgeting, food safety, healthy lifestyles, healthy food consumption, meal planning, and nutritious food preparation.

The Division developed improved crop and animal systems to boost U.S. agricultural production and improve the global capacity to meet the growing food demand:

The University Of Arkansas Division Of Agriculture provided unbiased research-based information and technical assistance on topics related to crop production, animals and animal products. Information was disseminated focusing on the needs of consumers, the general public and livestock and row crop producers. The UA Division of Agriculture faculty worked together to understand related issues of livestock and row crop production, products and processing, and aquaculture. Aquaculture programs were conducted through collaborative efforts between UA educators and aquaculture faculty of the 1890 land grant institution, University of AR Pine Bluff. These activities expanded our knowledge of the impact on environmental and economic sustainability and the well-being of animals and humans alike. The goal of the research program was to provide pertinent basic and practical information row crop, animal and poultry production in order to remain competitive in the global market place.

2. Brief description of the target audience

- The primary targeted audiences consist of the following:
- Supplemental Nutrition Assistance Program participants
- Low income adults
- Agricultural producers
- Aquaculture producers

- Agricultural businesses
- Allied industry personnel
- Consultants
- Breeder managers
- Hatchery managers
- Commercial poultry producers
- Commercial poultry companies
- Other non-Division of Agriculture researchers
- Research funding personnel & agencies
- Policy and decision makers
- Public

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA}	{NO DATA}	{NO DATA}	{NO DATA}
Actual	293885	181248	22056	235

2. Number of Patent Applications Submitted (Standard Research Output)

Patent Applications Submitted

Year: 2010

Plan:

Actual: 9

Patents listed

- 1)Application of material properties to improve grain drying
- 2)Predicting Fertilizer N Needs from Digital Images
- 3)Development of a Universal Vaccine for Campylobacter Species for Animals and Man
- 4)Enhanced Immune Responses to Bacillus-vectored Avian Influenza Epitopes
- 5)Recovery of Bound Procyanidins from Cranberry Pomace
- 6)White Diamond and White Cloud Peaches
- 7)APF-45 (Prime -Ark 45 Blackberry)
- 8)Iodinated Casein and Nutrient In Ovo Injection in Turkey and Chicken Eggs
- 9)Avian Influenza H5N1 Specific Monoclonal Aptamer

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	16	93	109

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of animal educational programs, workshops, educational meetings and/or field days.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	386

Output #2

Output Measure

- Number of clientele attending animal educational programs (field days, workshops, etc.)
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	11906

Output #3

Output Measure

- Number of animal producers receiving educational material (newsletters, fact sheets, etc.)
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	133032

Output #4

Output Measure

- Number of animal producers conducting on farm demonstrations.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	99

Output #5

Output Measure

- Number of farm visits or one-on-one consultations with animal producers.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	5062

Output #6

Output Measure

- Number of agronomic production education meetings (multi-topic) for food-related plant & plant products.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	27

Output #7

Output Measure

- Number of production education meetings that address fertilizer, soil and water management.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	107

Output #8

Output Measure

- Number of agronomic production education meetings that address variety selection for food-related plant & plant products.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	138

Output #9

Output Measure

- Number of production meetings that address soil & water testing for food-related plant & plant products production.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	92

Output #10

Output Measure

- Number of production meetings that address variety/hybrid selection for food-related plant & plant products production.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	113

Output #11

Output Measure

- Number of demonstrations/on-farm research for food-related plant & plant products production.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	303

Output #12

Output Measure

- Number of farm visits for food-related plant & plant products production.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	60

Output #13

Output Measure

- Number of field days for food-related plant & plant products production.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	2

Output #14

Output Measure

- Number of informal surveys of participants to measure cultural practices for food-related plant & plant products production.
- Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	0

Output #15

Output Measure

- Number of hits to plant and plant products web-based educational material for food-related

production information.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	475716

Output #16

Output Measure

- Number of for food-related plant & plant products production clientele contacts from education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational methods.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	306

Output #17

Output Measure

- Number of food-related plant & plant products production education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational events.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	0

Output #18

Output Measure

- # of clientele trained on Agricultural and Food Biosecurity

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	1492

Output #19

Output Measure

- # of educational materials developed on Agricultural and Food Biosecurity.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	245

Output #20

Output Measure

- # of Agricultural and Food Biosecurity assessments completed.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	0

Output #21

Output Measure

- # of requested consultations related to exotic animal disease concerns.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	30

Output #22

Output Measure

- # of hits to CES website regarding avian biosecurity.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	22935

Output #23

Output Measure

- # of hits to CES website regarding livestock biosecurity.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	17713

Output #24

Output Measure

- # of plants sites surveyed or monitored.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	30

Output #25

Output Measure

- # of farms visited or one-on-one consultations with clientele related to Biosecurity.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	0

Output #26

Output Measure

- # of grants written and funded in support of Food and Nutrition education programming and research.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	1

Output #27

Output Measure

- # of non-duplicated participants in Foods and Nutrition education 4-H programs.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	2221

Output #28

Output Measure

- # of Food and Nutrition in-service trainings conducted

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	10

Output #29

Output Measure

- # of Foods and Nutrition education programs clientele contacts from education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational methods.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	14001

Output #30

Output Measure

- # of Foods and Nutrition educational classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational events.

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	13295

Output #31

Output Measure

- # attending Agricultural Systems education classes, workshops, group discussions, one-on-one interventions, and other educational methods

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	3867

Output #32

Output Measure

- # of demonstrations (for example demonstration study farm, food plots, etc.)

Not reporting on this Output for this Annual Report

Year	Target	Actual
2010	{No Data Entered}	1

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants who indicated that they increased their knowledge related to foods and nutrition following an educational class, seminar or workshop.
2	Number of individuals who increased physical activities as a result of completing an Extension program.
3	Number of participants who adopted positive nutrition practices.
4	Number of participants who indicated that they intend to adopt one or more healthy food/nutrition practices.
5	Number of business start ups related to animal and animal products
6	Number of livestock producers who increased knowledge or gained awareness related to livestock production management practices
7	Number of livestock producers who adopted a new practice
8	Number of livestock producers who initiated or improved their record keeping
9	Number of poultry producers who adopted new practices or technology
10	Number of allied poultry industry personnel who adopt new practices or technology.
11	Number of livestock producers who changed a management practice
12	Arkansas cash receipts from farm marketing (\$1,000) related to aquaculture enterprises.
13	Number of clientele who reported knowledge gained related to aquaculture.
14	Number of clientele who adopted new aquaculture practices.
15	Acres of harvested wheat (all)
16	# of clientele who select improved varieties
17	# of clientele using soil testing

18	# of clientele using plant testing
19	# of impacted acres using soil testing
20	# of impacted acres using plant testing
21	# of clientele (non-duplicated) who use the DD50 program for improved production efficiency
22	# of impacted acres using the DD50 program for improved production efficiency
23	# of clientele using RICESEED program
24	# of acres planted based on output from RICESEED program
25	Yield (bushels) of harvested wheat (all)
26	Value of production of harvested wheat (all)
27	Acres of harvested soybeans (all)
28	Yield (bushels) of harvested soybeans
29	Value of production of harvested soybeans (all)
30	Acres of harvested rice (all)
31	Yield (pounds) of harvested rice (all)
32	# of growers/producers reporting knowledge gained or increased awareness of need for biosecurity.
33	# of growers/producers reporting intent to adopt new biosecurity practices for animal production facilities.
34	# of growers/producers adopting new practices outlined in educational programs to improve biosecurity through proper methods of sanitation, disease prevention, recognition, and control.
35	# of diagnostic invasive plant samples
36	# of diagnostic invasive nematode samples

37	# of avian samples submitted to diagnostic laboratories for exotic animal disease testing
38	# of Asian Soybean Rust positive samples
39	# of clientele who reported knowledge gained
40	# of clientele who initiated an alternative enterprise, as self reported

Add Cross-cutting Outcome/Impact Statement or Unintended or Previously Unknown Outcome Measure

Outcome #1

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of participants who indicated that they increased their knowledge related to foods and nutrition following an educational class, seminar or workshop.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1573

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Food security is defined as households having access, at all times, to enough food for an active, healthy life for all household members. A report by the U.S. Department of Agriculture states that Arkansas is the fourth worst state in the nation for food insecurity (17.9 percent of all Arkansas households were food insecure). Groups with higher rates than the national average are households with incomes below the official poverty line, children in households headed by a single woman, Black and Hispanic households.

What has been done

EFNEP in Arkansas provides one-on-one and group education within 12 priority counties with a high food stamp and Hispanic population. The programs are informal and available at convenient

locations and times. Program Assistants indigenous to the target population deliver intensive multi-session nutrition education lessons. The majority of adult participants complete the EFNEP curriculum in less than 12 months. Youth are taught in schools, after school environments and through summer enrichment programs.

Results

Participants enrolled - 2366, included 7,956 family members. Overall 1573 participants completed the program. The number of participants who indicated they increased their knowledge/skills related to healthy food choices as a result of completing a nutrition education program - 1566. The number of participants who reported they were more often comparing prices before they buy food as a result of completing the nutrition education program - 951. The number of participants who reported they seldom run out of food before the end of the month as a result of completing the nutrition education program - 876.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #2

1. Outcome Measures

Not Reporting on this Outcome Measure

Number of individuals who increased physical activities as a result of completing an Extension program.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1466

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals

- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #3

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of participants who adopted positive nutrition practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1474

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #4

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of participants who indicated that they intend to adopt one or more healthy food/nutrition practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #5

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of business start ups related to animal and animal products

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Economic and environmental sustainability were two of the most critical issues to Arkansas livestock and poultry producers. Management at the production level is the most direct method of producer impact on these issues. During 2008, soaring costs of feed, fertilizer and fuel and challenging environmental regulations pertaining to use of poultry litter as fertilizer were foremost on the minds of livestock and poultry producers. Addressing these issues will determine the viability of animal agriculture in Arkansas.

What has been done

Extension personnel at all levels identified the most appropriate methods of dealing with the issues. A combination of traditional local extension programming, electronic newsletters, multi county programming, cooperation with industry organizations, and all forms of mass media and personal consultations were used to provide the latest production information. Three projects, two funded by NRI grants and one by industry, are developing different strategies to improve sustainability. Strategies are: use of direct-fed microbials to young pigs as a way to reduce antibiotic use, optimization of non-toxic fescues to reduce fuel and other inputs to cattlemen, and use of no-till and low-till technology that saves over \$100/acre in fuel, labor and equipment costs for cattlemen.

Results

By product feeds from biofuels production have replaced much of traditional sources of feed for cattle. Practices long known to be important (i.e. soil testing, forage testing, etc.) have been brought to the attention of producers who once again understood their importance. Management techniques like stockpiling forage rather than baling, using no till or minimum till to reduce fuel use, planning grazing systems to maximize production and reduce input costs, addressing the issue of increased internal parasite resistance, understanding target points for marketing cattle, and developing BMP's for poultry litter use have helped Arkansas producers adapt to the challenges presented in 2010.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #6

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of livestock producers who increased knowledge or gained awareness related to livestock production management practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	5514

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Economic and environmental sustainability were two of the most critical issues to Arkansas livestock and poultry producers. Management at the production level is the most direct method of producer impact on these issues. During 2009, soaring costs of feed, fertilizer and fuel and

challenging environmental regulations pertaining to use of poultry litter as fertilizer were foremost on the minds of livestock and poultry producers. Addressing these issues will determine the viability of animal agriculture in Arkansas.

What has been done

A combination of traditional local extension programming, electronic newsletters, multi county programming, cooperation with industry organizations, and all forms of mass media and personal consultations were used to provide the latest production information. Three projects, two funded by NRI grants and one by industry, are developing different strategies to improve sustainability. Strategies are: use of direct-fed microbials to young pigs as a way to reduce antibiotic use, optimization of non-toxic fescues to reduce fuel and other inputs to cattlemen, and use of no-till and low-till technology that saves over \$100/acre in fuel, labor and equipment costs for cattlemen.

Results

By product feeds from biofuels production have replaced much of traditional sources of feed for cattle. Practices long known to be important (i.e. soil testing, forage testing, etc.) have been brought to the attention of producers who once again understood their importance. Management techniques like stockpiling forage rather than baling, using no till or minimum till to reduce fuel use, planning grazing systems to maximize production and reduce input costs, addressing the issue of increased internal parasite resistance, understanding target points for marketing cattle, and developing BMP's for poultry litter use have helped Arkansas producers adapt to the challenges presented in 2010.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population

- 724 - Healthy Lifestyle

Outcome #7

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of livestock producers who adopted a new practice

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1334

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Economic and environmental sustainability were two of the most critical issues to Arkansas livestock producers. There are practices that can help deal with these challenges. Oftentimes, small producers who make up a large percentage of Arkansas producers are not aware of new issues and the solutions that may be available.

What has been done

Extension personnel at all levels identified emerging issues of importance to their stakeholders. Using appropriate information delivery venues, a combination of traditional local extension programming, electronic newsletters, multi-county programming, cooperation with industry organization, and all forms of mass media and personal consultations were used to provide options.

Results

Because of heightened awareness that provided teachable moments, new practices ranging from more efficient grazing systems, stockpiling forage rather than expensive hay baling, well-designed fertilization programs, changed market in points for cattle to capture the increased value of forage brought on by high feedlot finishing costs, increased targeted use of by-products from biofuels production, better designed programs for efficient and environmentally sustainable use of poultry litter on pastures and other practices were adapted. Numbers listed are direct contact and we recognize that others probably adapted these practices.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #8

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of livestock producers who initiated or improved their record keeping

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
------	---------------------	--------

2010 {No Data Entered} 565

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

In addition to the traditional reasons for record keeping, other issues are forcing greater requirements for record keeping, environmental regulations for poultry litter application on pasture, new traceability requirements by industry to document management practices, and requirements by government to comply with country of origin labeling.

What has been done

Information was disseminated on all these subjects, including not only rules and requirements but information on modern technology to trace animals, record and store data and comply with existing and emerging requirements.

Results

Best management practices for utilization of poultry litter are being adopted and used. A number of cattle producers are utilizing electronic identification tags for their calves in order to receive bonus for age and source verified calves. Producers are aware they may be required to document age, source, management practices and other production information to compete in a market place that increasingly is requiring proof of these factors. Data from records (financial and production) are being used to make selection decisions at the herd level and document the real value of cattle in the market place.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population

- 724 - Healthy Lifestyle

Outcome #9

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of poultry producers who adopted new practices or technology

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	254

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals

- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #10

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of allied poultry industry personnel who adopt new practices or technology.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	162

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Poultry related jobs accounted for nearly \$3 billion in labor income in Arkansas or \$1 out of every \$4 in agricultural labor income. The over \$3.3 billion in cash receipts from the poultry industry amounted to 46.2% of all agricultural cash receipts. In addition, the poultry industry contributed over \$2.6 billion in value added to the Arkansas economy. Yet owners of the 5640 poultry farms struggle to maintain competitive production efficiencies via new technology adoption.

What has been done

Applied research and field trials conducted by Extension Poultry faculty identified unsuitable energy technologies as well as problems with drinking water treatment, litter processing and feed delivery technologies. Information gained from applied research and field trials was shared with

vertically integrated companies, allied industry representatives and production personnel via trade publications, workshop, one-on-one consultations, newsletters and CES publications.

Results

Informal observations indicated increase knowledge of drinking water treatment and litter processing technologies. In addition, technology adoption rates were estimated at 15%, resulting savings of proximately \$6.3 million. Poultry producers are researching the adoption of using more energy efficient lights which will decrease lighting electrical use by 80 to 85%.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #11

1. Outcome Measures

- Not Reporting on this Outcome Measure
Number of livestock producers who changed a management practice

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1118

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Economic and environmental sustainability were two of the most critical issues facing Arkansas livestock producers. There are practices that can help deal with these challenges. Oftentimes, small producers who make up a large percentage of producers are not aware of new issues and available solutions.

What has been done

After stakeholders repeatedly said they needed to see how technology could be applied to real-world scenarios, a model farm was established at one of our Research and Extension Stations. The model farm demonstrates to cattlemen, especially small producers, not only how to actually incorporate and integrate critical research-based practices in a practical setting but also how to monitor results with accurate budgets.

Results

Because of heightened awareness that provided teachable moments, new research based practices ranging from more efficient grazing systems, stockpiling forage rather than expensive hay baling, well-designed fertilization programs, changed market in points for cattle to capture the increased value of forage brought on by high feedlot finishing costs, increased targeted use of by-products from biofuels production, better designed programs for efficient and environmentally sustainable use of poultry liter on pastures and other practices were adopted.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants

- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #12

1. Outcome Measures

- Not Reporting on this Outcome Measure

Arkansas cash receipts from farm marketing (\$1,000) related to aquaculture enterprises.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #13

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of clientele who reported knowledge gained related to aquaculture.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This outcome is reported in Natural Resources and Environment program area.

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #14

1. Outcome Measures

- Not Reporting on this Outcome Measure

Number of clientele who adopted new aquaculture practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This outcome is reported in the Natural Resources and Environmental program area.

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior

- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #15

1. Outcome Measures

- Not Reporting on this Outcome Measure
Acres of harvested wheat (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	150000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals

- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #16

1. Outcome Measures

- Not Reporting on this Outcome Measure
of clientele who select improved varieties

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	5769

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Corn acreage has expanded in Arkansas in the past few years as corn grain prices have risen and producers see the benefit of including corn in their crop rotations. With the increase in acreage and increasing number of producers that are growing corn (many for the first time), there is a great need to educate county agents and producers how to grow high yielding profitable corn.

What has been done

The Arkansas Corn Research Verification program serves as an educational tool to educate county agents and producers about up-to-date management practices for growing corn in Arkansas. The program takes Arkansas generated research and demonstrates it on a whole field basis. The program begins the fall before corn is to be planted. The verification coordinator

and county agent sit down with the producer and discuss hybrid selection, field selection, fertility needs for the field, seeding methods, and any other issues that may arise during the growing season. Once the corn is planted, the coordinator and agent make weekly visits to the field to monitor crop progress and prescribe any inputs that the crop may need. The producer also walks the field with the coordinator and agent to learn firsthand. The producer is asked to keep track of all inputs that are applied to the field so that an economic analysis can be performed at the end of the season to determine profitability of the field.

Results

In 2010, following University of Arkansas corn production recommendations for hybrid selection, fertility management, weed and insect control, and irrigation management, corn producers in the verification program were able to reach maximum yields. Yields in the verification program averaged 204 bu/acre, which was the second highest average yield the program has ever had. The state average corn yield was 150 bu/acre. The high yields in the verification program were due to proper hybrid selection, planting rates, adequate fertility, weed control, and irrigation. The drought of 2010 showed that irrigation is very important. With proper irrigation and management, verification fields yielded 54 bu/acre more than state average fields. $54 \text{ bu/acre} \times \$5.00/\text{bu} = \$270/\text{acre}$ gain in gross revenue compared to state average fields. This shows that Arkansas corn producers can grow high yielding profitable corn following University of Arkansas Cooperative Extension Service recommendations.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #17

1. Outcome Measures

- Not Reporting on this Outcome Measure
of clientele using soil testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	4131

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Direct-seeded, delayed flood rice (*Oryza sativa* L.) represents an important commodity for many Mid-south states in the US and is at times grown continuously, but more often grown in rotation with soybean [*Glycine max* (L.) Merr.] or other crops. Arkansas is the primary rice producing state in the US and harvests roughly 1.3 million acres per year. Current N fertilizer recommendations for rice in Arkansas are based on cultivar, previous crop, and soil texture which does not account for potentially mineralizable soil-N. Recommendations made using the current system do not take into account the amount of N that is being supplied by the soil and thus, can result in over or under application of N fertilizer. This in turn could cause economic losses due to reduced grain yields, increased disease susceptibility and lodging. Identification of a soil-based nitrogen test for rice production will allow more precise application of nitrogen fertilizers while utilizing native soil nitrogen and lowering potential environmental impacts due to excessive nitrogen application.

What has been done

A seven year study involving laboratory and field trials have developed an alkali direct steam distillation technique for determining the nitrogen mineralization potential of a soil. Results collected from 25 site-years on silt loam soils shows a strong correlation ($r^2= 0.89$) between the nitrogen fertilizer required to achieve 95% relative grain yield for rice and the nitrogen liberated with the new soil test when the soil was sampled to the 18 inch depth. The new soil nitrogen test is named 'Nitrogen-Soil Test for Rice' or 'N-ST*R'. N-ST*R was validated at 12 silt loam sites in 2010 that varied in native soil nitrogen availability. N-ST*R predicted the correct nitrogen fertilizer rate to achieve 90, 95 and 100% relative grain yield at all 12 sites. Validation studies will continue in 2011 with more focus placed on the implementation of field-scale strip trials for research and demonstration. The states of Louisiana, Mississippi, and Texas have continued to collaborate

with us on the development of N-ST*R for silt loam soils and validation should begin shortly. The success of N-ST*R on silt loam soils in Arkansas has led to research with clay soils in the hope that we can have a nitrogen test for all of the soils where rice is grown in Arkansas and the southern Ricebelt.

Results

The new Nitrogen-Soil Test for Rice or N-ST*R will allow site-specific nitrogen fertilizer rate recommendations for rice because it will enable the producer to make nitrogen fertilizer decisions on an individual field basis rather than relying on a regional soil type basis. Implementation of N-ST*R will enable the optimal use of nitrogen fertilizer leading to the most optimum agronomic and economical rice yield with minimal disease and lodging while lowering the potential impact of the nitrogen fertilizer to the surrounding environment.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #18

1. Outcome Measures

- Not Reporting on this Outcome Measure
of clientele using plant testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	3419

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals

- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #19

1. Outcome Measures

- Not Reporting on this Outcome Measure
of impacted acres using soil testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1848462

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Phosphorus is an essential plant nutrient and P fertilization may increase corn yields in Arkansas soils. However, excessive build up of P in agricultural soils will increase the likelihood of P loss via runoff and pose a risk to water quality. Accurate soil test-based, assessment of soil P fertility and appropriate P fertilizer recommendations is the most effective process for producing optimum corn yields and reducing the risk of excessive soil P buildup.

What has been done

Five replicated P fertility experiments were conducted to evaluate corn response to application of 0 to 160 lb P₂O₅/acre in 40 lb P₂O₅/acre increments. These soils were typical of soils used for corn production in Arkansas. Soil texture ranged from silt loam to clay loam and available soil P as measured by Mehlich-3 procedure ranged from Low to Above Optimum.

Results

Corn seedling P concentration, dry matter accumulation, or P uptake at two of the sites that were rated Above Optimum were not influenced by P fertilization. However, P fertilization significantly increased P concentration, dry matter, and P uptake at one site that was rated Low in P. At this site P application significantly increased ear-leaf P. Yields at the Low P testing site were lower than expected and ranged from 122 to 128 bu/acre suggesting that another factor (such as N availability) was more limiting than P availability. Corn grain yields at the other four sites were not influenced by P fertilization. The lack of significant grain yield increases to P fertilization is not surprising since soil test P was either Medium or Above Optimum at these sites.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #20

1. Outcome Measures

- Not Reporting on this Outcome Measure
of impacted acres using plant testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	12482

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Nitrogen fertilization is important for corn yield, but applying too much N is expensive and has environmental consequences. Current methods of determining how much N to apply during the season require specialized equipment or have long turn-around times that limit their utility.

What has been done

We developed a method of determining N status of corn leaves by measuring "greenness" of leaves from digital images. Data from two years at multiple locations show that "greenness" is closely associated with leaf N concentration and that "greenness" from digital images taken at tasseling is closely associated with corn grain yield.

Results

The only equipment necessary for measuring "greenness" of corn leaves is a digital camera. Digital images could be sent to a website or researcher for quick and inexpensive evaluation of leaf N status. Continuing research is focused on calibrating "greenness" values from young corn plants to determine appropriate amounts of N fertilizer to apply.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals

- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #21

1. Outcome Measures

- Not Reporting on this Outcome Measure
of clientele (non-duplicated) who use the DD50 program for improved production efficiency

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	621

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #22

1. Outcome Measures

- Not Reporting on this Outcome Measure
of impacted acres using the DD50 program for improved production efficiency

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	434628

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Conditions for optimum production were less than ideal during 2010. Optimum planting weather lead to record acreage planted about 3 weeks ahead of normal. However, heat and drought that followed resulted in significant crop failures due to inadequate irrigation water and high incidence and severity of bacterial panicle blight. The heat, particularly high night time temperatures, was also responsible for overall reduced yield and reduced milling yield. While the state average yield of 144 bu/acre were less than any year since 2000 and certainly less than the 161 bu/acre record, the yield was as higher than any yield prior to 2000. In spite of the weather adversity, variety development and rice management has allowed many growers to still produce good rice yields

What has been done

Rice educational programs have included traditional means such as county production meetings, newsletters, and fact sheets for several years. As the clientele have become more dependent upon electronic access to data and social media, an opportunity was present to expand the educational methods with which we have become familiar. We initiated the use of social networking and internet blogging as an additional means of providing access to unbiased recommendations. Educational information written for was posted to a blog and then also posted on a Facebook fan page and a Twitter page. One of the advantages of these opportunities has been the access to non-conventional audiences.

Results

We have had over 4,000 visits to the blog, we have 65 followers in Twitter and 455 following on Facebook who receive information weekly during the growing season. This technology has not only allowed us to meet the needs of traditional clientele, we have also been able to reach the technologically savvy client base and the numbers continue to grow each week. An additional, yet unexpected, impact has been the ability to reach non-traditional clientele. While the history of this program is to provide timely production technology information to growers, consultants, and agricultural industry representatives, the use of social media has allowed us to reach everyday citizens that are not directly involved in the agriculture business. The general public's awareness of the importance of agriculture in this country for their food supply is declining. This technology has allowed us to reach a new audience and be able to highlight the contribution of rice production to the US economy and food supply.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes

- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #23

1. Outcome Measures

- Not Reporting on this Outcome Measure
of clientele using RICESEED program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	213

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #24

1. Outcome Measures

- Not Reporting on this Outcome Measure
of acres planted based on output from RICESEED program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	89063

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #25

1. Outcome Measures

- Not Reporting on this Outcome Measure
Yield (bushels) of harvested wheat (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	56

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Urea is the most common N source used for fertilization of row crops in Arkansas. A large proportion of the urea that is applied to summer-grown crops is commonly amended with Agrotain, a urease inhibitor. Research has shown that this product consistently reduces N loss via ammonia volatilization from surface applied urea when environmental (weather and field conditions plus crop management) conditions are conducive. Growers have questioned whether a urease inhibitor would be of benefit for urea applied to winter wheat in February and March, when weather related factors are less conducive for ammonia loss.

What has been done

Research was established in six different fields during a 3-year period with N applied at four different times between mid February and early April. Urea and Agrotain-treated urea were applied at a suboptimal rate of 75 lb N/acre and at a near-optimal rate of 125 lb N/acre. The suboptimal N rate was used to evaluate whether wheat yield benefited from the urease inhibitor and the near optimal N rate examined how N application time influenced wheat yield.

Results

Research results, averaged across 24 N applications, showed a 3% yield benefit from urea amended with the urease inhibitor compared to urea alone. Wheat yield response to the urease inhibitor across 24 N applications was further characterized to understand the magnitude and frequency of the benefit. Results indicated the urease inhibitor, compared to urea only, provided no significant yield change 58% of the time, but yields were increased by, on average, 4, 6, 13 bu/acre for 21, 13, and 8% of the N applications, respectively. These results indicate that ammonia loss can be significant and lead to reduced yield in some wheat fields. Additional research is needed to understand the factors controlling these losses and provide more specific recommendations to wheat growers.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals

- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #26

1. Outcome Measures

- Not Reporting on this Outcome Measure
Value of production of harvested wheat (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	140000000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms

- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #27

1. Outcome Measures

- Not Reporting on this Outcome Measure
Acres of harvested soybeans (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	3150000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #28

1. Outcome Measures

- Not Reporting on this Outcome Measure
Yield (bushels) of harvested soybeans

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	37

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

An estimated 350,000 acres of soybean were infested with glyphosate-resistant Palmer amaranth (pigweed) in Arkansas in 2010. This problem cost growers an estimated 42 million dollars in the form of added weed control cost and lost yield. The only weed-control system similar to RoundUp Ready is the LibertyLink/Ignite herbicide system. Since LibertyLink soybean varieties have only been commercially available since 2009, little is known about how these varieties will perform in Arkansas.

What has been done

In 2009 and 2010, a RoundUp/LibertyLink Systems Comparison study was conducted at two different locations. Three LibertyLink and four RoundUp Ready soybean varieties were evaluated in this study. Soybean varieties ranged in maturity groups from 4.8 to 5.1. Each location was sprayed with Prefix herbicide preplant, and two applications of RoundUp or Ignite herbicides during the growing season depending upon the soybean variety. Yield and other agronomic characteristics were evaluated for each soybean variety.

Results

Results from this research have shown that currently available LibertyLink soybean varieties have yields very comparable to some of the highest yielding and popular RoundUp Ready soybean varieties. It appears that these LibertyLink soybean varieties do not have the "yield drag" that the original RoundUp Ready soybean varieties had when initially released. With the increase in soybean acreage infested with glyphosate-resistant Palmer amaranth, as much as 875,000 acres in Arkansas can be planted with LibertyLink soybean varieties. Use of the LibertyLink/Ignite system could save soybean producers 105 million dollars in lost yield due to glyphosate-resistant Palmer amaranth.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes

- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #29

1. Outcome Measures

- Not Reporting on this Outcome Measure
Value of production of harvested soybeans (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1165500

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Soil tests are not infallible, but they represent the best available science for making sound soil nutrient and crop fertilizer management decisions. Proper interpretation of soil-nutrient availability index values requires that the availability index be reasonably well correlated with crop growth/yield response to the addition of that nutrient. Previous Arkansas research has shown that the Mehlich-3 soil test is an excellent indicator of soil K availability, but the accuracy and interpretation of phosphorus (P) extracted by this method have not been properly assessed for soybean.

What has been done

Forty site-years of research were established from 2004 to 2010 to evaluate soybean response to P fertilization. Each trial evaluated soybean yield response to two to five different P rates compared to soybean receiving no P. Mehlich-3 extractable soil P (0-4 inch depth) was measured at each site.

Results

The Mehlich-3 P availability index was significantly correlated with the relative yield of soybean receiving no P fertilizer. Mehlich-3 P explained 32% of the soybean yield variation among site-years and was highly (90% of the time) accurate at predicting that soil with >20 ppm P required little or no P fertilizer to increase yield. For soils testing 11-20 and <11 ppm, positive (6-12% increases) yield responses to P fertilization occurred 25 and 63% of the time, respectively. Based on these findings, P fertilizer recommendations for soybean were revised for the 2011 cropping season. The rates of P recommended for soils having Very Low to Medium P levels were reduced. Additional research is being conducted in effort to improve the accuracy of P fertilizer recommendations on soils having low P availability index values by the addition of more site-years, examining other soil test methods, and use of other soil chemical properties in addition to P.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #30

1. Outcome Measures

- Not Reporting on this Outcome Measure
Acres of harvested rice (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1785000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Arkansas farmers produce more than 45 percent of the rice grown in the United States under dynamic production conditions that differ from those in other rice-growing areas. Because of their prominence in this crop, Arkansas rice farmers depend on an Arkansas variety development program that provides a progression of improved varieties to meet the challenges of changing conditions in their fields and in the marketplace for rice.

What has been done

Arkansas rice producers provide check-off funds administered by the Arkansas Rice Research and Promotion Board to help support a dynamic rice breeding program by Arkansas scientists in cooperation with researchers in other states and the USDA. Check-off funding for the breeding program was started in 1980 and has increased substantially over the years. Twenty-four varieties have been released from the Arkansas breeding program since 1980. Each variety comes with management recommendations developed through research on plant nutrients, diseases, insect pests, weeds and other areas. These recommendations help farmers tailor practices to the genetic potential of each variety. Genetic improvement in disease resistance, plant types, grain and milling yields, quality and other traits have helped increase yield and grain quality while controlling production costs.

Results

Twenty-four percent of the rice grown in Arkansas in 2010 was comprised 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 lbs/acre compared to 6300 lbs/acre in 2010. Assigning a conservative value of 60 percent of this 2190 lbs/acre yield increase to new varieties, the average monetary gain in 2010 over 1980, at a rough rice price of \$9.60/cwt, would be \$210/acre or \$353 million for the 1.681 million acres grown in Arkansas, of which \$85 million is due to the Arkansas varieties.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water

- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #31

1. Outcome Measures

- Not Reporting on this Outcome Measure
Yield (pounds) of harvested rice (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	6480

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Water costs for producing rice in Arkansas have been increasing in the recent past by a combination of deeper available water, increased fuel and energy costs and two extremely dry summers. Ways to reduce these costs are needed very much. One way to reduce these costs is to drain rice fields for harvest at a time which will allow water savings and a low likelihood of reducing rice yield or quality.

What has been done

A computer program to drain rice fields based on stages of development has been developed. The program includes inputs from farmers on variety, soil and heading date. The results from the program are predicted dates for successive reproductive rice growth stages, water use during each stage and a predicted stage of development for draining which will allow the field to be drained and the water held in the soil at draining will allow the crop to develop to maturation without experiencing a yield- or quality-limiting water deficit.

The model has been tested for five years in the field against later draining control treatments. Yields have not been reduced for the treatments drained by the program compared to the control treatments in any year. Head rice yields have not been reduced in any year so far for the treatments drained by the computer program compared to later drained controls.

In 2010, six additional cultivars have been observed to provide extension of the model to a number of different rice cultivars and eventually for all rice cultivars common grown in Arkansas. In addition, in 2010, experimental tests of the water use predictions of the model were tested and confirmed.

Results

We find a usual minimum water savings of one less 3 inch irrigation. Water savings from one less 3-inch irrigation would be \$4.15 per acre for a water depth (depth to pump) of 50 feet. Water savings would be \$22.45 per acre for a water depth (depth to pump) of 300 feet. Other potential savings include reduced tillage costs due to harvesting in wet soil conditions. Moreover, earlier draining of rice fields would result in less depletion of aquifers. In the future, the model will be extended to a wide range of rice cultivars.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals

- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #32

1. Outcome Measures

- Not Reporting on this Outcome Measure

of growers/producers reporting knowledge gained or increased awareness of need for biosecurity.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	1686

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Soybean rust continues to be a potential threat to Arkansas. Each year spores move northward into Arkansas. With no resistance to the disease, it is imperative that the geographic development of soybean rust over time be monitored so growers can protect their crops, or avoid unnecessary fungicide applications if not warranted.

Livestock and poultry producers contribute significantly to the economy of Arkansas. Any disease outbreak in a herd or flock has the potential to severely impact the growers and producers and the economy.

What has been done

With support of the Arkansas Soybean Promotion Board, the United Soybean Board, and the

North Central Soybean Research Program, Division of Agriculture plant pathologists monitored 30+ sentinel plots, various kudzu locations, and cooperating grower fields in 2010 for Soybean rust. An awareness and information campaign was also implemented to warn growers and provide them with the knowledge to make informed control decisions statewide if the disease was detected.

Educational efforts were provided by Division personnel to assist livestock and poultry producers with Biosecurity and disease prevention on their farms and ranches.

Results

Soybean rust was first detected in August 2009 in southeast Arkansas and was confirmed in every soybean production county of the state that year. Soybean sentinel plots in 30+ counties were monitored for the disease in 2010. No samples were positive for the disease in 2010 due to abnormally hot, dry conditions. Vigilance and implementation of Biosecurity measures by commercial and individual livestock and poultry producers continue to enhance efforts to diseases on Arkansas farms and ranches.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #33

1. Outcome Measures

Not Reporting on this Outcome Measure

of growers/producers reporting intent to adopt new biosecurity practices for animal production facilities.

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	320

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The total farm value of livestock, poultry and crops in Arkansas is over 3 billion dollars with poultry a major agricultural product. Exotic disease outbreaks in Arkansas or in the United States could result in a quarantine of poultry and poultry products severely impacting the economy of the state and individual growers/producers in particular.

What has been done

Biosecurity and early disease recognition continue to be the mainstay for prevention and control of disease. Biosecurity enhancement measures were communicated to growers/producers through formal presentations and publications. The continued improvement of Biosecurity protocols allows for better disease protection of a flock by reducing the exposure risk.

Results

Prevention and/or reduction in the incidence of disease can result in savings of millions of dollars. This vigilance and implementation of Biosecurity protocols by growers/producers further enhances the efforts to prevent diseases such as "bird flu" which are of great concern not only because of the economic consequences of an outbreak but because of the potential adverse human health problems associated with the disease.

4. Associated Knowledge Areas

102 - Soil, Plant, Water, Nutrient Relationships

111 - Conservation and Efficient Use of Water

- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #34

1. Outcome Measures

- Not Reporting on this Outcome Measure

of growers/producers adopting new practices outlined in educational programs to improve biosecurity through proper methods of sanitation, disease prevention, recognition, and control.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	279

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Poultry is a major agricultural product in Arkansas and is valued at close to 3 billion dollars. Mortality figures associated with broilers, turkeys, and layers, are 4%, 8%, and 16% respectively over the life of the flock with infectious diseases a major cause of the mortality and responsible for an additional 1+% loss in condemnations.

Exotic disease outbreaks in Arkansas or in the United States could result in a quarantine of poultry and poultry products severely impacting the economy of the state.

What has been done

The continued threat of Agroterrorism against the United States animal population is such that vigilance is needed to prevent the use of infectious diseases as a weapon against the United States food supply. The impact of an Agroterrorism attack against the US food supply would cause a devastating effect on product exportation and losses of markets which could be irreparable.

Results

The loss of confidence in the safety of the US food supply could be incalculable. Informal surveys indicate that growers/producers in Arkansas have implemented procedures and practices to increase Biosecurity to decrease the risk of disease introduction or spread. The continued concern over H1N1 (Swine Flu) and H5N1 (Bird Flu) reinforce the continued need for Biosecurity practices to prevent disease. The control of diseases is greatly enhanced as growers/producers continue to improve their Biosecurity practices.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems

- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #35

1. Outcome Measures

- Not Reporting on this Outcome Measure
of diagnostic invasive plant samples

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	700

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Monitoring of crops for potential biosecurity pathogens remains a systematic and sustained challenge for Arkansas production. Introductions of new pathogens, or the evolution of new strains from existing populations, continue to be a potential threat to sustainable food production in the U.S. A single, new disease can result in millions of lost dollars in additional control costs, on top of new investments in research and education to modify management systems.

What has been done

With support of the Arkansas Soybean Promotion Board, the United Soybean Board, and the North Central Soybean Research Program, Division of Agriculture plant pathologists monitored 30+ sentinel plots, various kudzu locations, and cooperating grower fields in 2010 for Soybean rust. An awareness and information campaign was also implemented to warn growers and provide them with the knowledge to make informed control decisions statewide if the disease was detected.

Results

Soybean rust was first detected in August 2009 in southeast Arkansas and was confirmed in every soybean production county of the state that year. Soybean sentinel plots in 30+ counties

were monitored for the disease in 2010. No samples were positive for the disease in 2010 due to abnormally hot, dry conditions.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #36

1. Outcome Measures

- Not Reporting on this Outcome Measure
of diagnostic invasive nematode samples

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Plant-parasitic nematodes can be a significant economic concern in many agronomic, horticultural, and ornamental commodities. The soybean cyst nematode (SCN) is the most important pest of soybean in the U.S., the southern root-knot nematode (SRK), and the reniform nematode (RN) are of major concern in many agronomic and horticultural crops. The rice white tip nematode (WT) is a seed borne pest that is endemic in Arkansas and is a pest of concern in international trade.

What has been done

The Arkansas Nematode Diagnostic Laboratory monitored incidence and population density of economically significant nematodes in grower-submitted samples and focused surveys of the state in 2010. In addition, soybean cultivars (296) were evaluated for resistance to SCN, SRK, and RN, and field collections of SCN from around the state were monitored for pathogenic variability in greenhouse bioassays. In addition, a survey of rice-production areas of the state were surveyed for the presence of both WT and the exotic nematode pest *Ditylenchus angustus*.

Results

Of the 957 grower-submitted samples statewide that were assayed by the ANDL, 351 (37%) contained SRK, 213 (22%) contained SCN, and 22 (3%) contained RN. In addition, 60% of 3,000 additional research or extension demonstration samples from cotton and vegetables from projects around the state that were assayed contained SRK and 80% of an additional 330 samples submitted from soybean research plots had SCN. Rice seed assays from 125 barges scheduled for international markets were assayed. WT was not detected in any of these samples. However, WT was found in 5 of 218 commercial rice fields surveyed in August, 2010, and in 11 of 54 experimental breeding line plots. No *D. angustus* was detected. In addition, bioassays of SCN from 67 fields in the state indicate that the majority of races in the state are races 2 and 5. Only 10 of the fields (15%) were the races that traditionally were found in Arkansas (races 3, 9, and 14), indicating that a shift to newer and more difficult to control races has occurred.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals

- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #37

1. Outcome Measures

- Not Reporting on this Outcome Measure

of avian samples submitted to diagnostic laboratories for exotic animal disease testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The value of the United States animal agriculture production is approximately 14% of the gross domestic product and represents approximately 19% of all employment with almost 1 million jobs. Exports represent approximately 24% of all animal production and account for over 140+ billion dollars. Poultry, a major agricultural product in Arkansas, is valued at almost 3 billion dollars and represents a significant portion of the state economy.

What has been done

New and continued foreign animal disease threats, the continued threat of Agroterrorism, and the continued concern over H5N2 and H1N1 necessitated increased awareness of diseases and efforts to monitor for and prevent outbreaks. Poultry integrators continued to conduct routine

serological surveillance for Avian Influenza on all poultry. This was conducted under the National Poultry improvement Plan. Backyard and small non-commercial poultry flock owners were contacted and provided with information on testing services and where these services were available.

Results

Commercial poultry growers and backyard hobby flock owners, due to increased awareness as a result of educational efforts, are more aware of testing programs and diagnostic laboratory assistance for disease determination and control. They recognize that the surveillance testing and diagnostic assistance are an integral part of the Biosecurity effort to reduce the risk of disease introduction and/or spread and protect the US food supply.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #38

1. Outcome Measures

- Not Reporting on this Outcome Measure
of Asian Soybean Rust positive samples

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Soybean rust continues to be a potential biosecurity threat to Arkansas and U.S. production since it first entered the country in 2004 and became established along the Gulf Coast subsequently. Each year, depending on temperatures and weather fronts, spores move northward into the soybean production states, and Arkansas with 3.4 million acres planted over 5 months in the spring, remains a keystone region for disease development and further advancement toward the Midwest. With no resistance to the disease in soybeans grown here, it is imperative that geographic development of soybean rust over time be monitored so growers can protect their crops, or avoid unnecessary fungicide applications if not warranted.

What has been done

With support of the Arkansas Soybean Promotion Board, the United Soybean Board, and the North Central Soybean Research Program, Division of Agriculture plant pathologists monitored 30+ sentinel plots, various kudzu locations, and cooperating grower fields in 2010 for Soybean rust. An awareness and information campaign was also implemented to warn growers and provide them with the knowledge to make informed control decisions statewide if the disease was detected.

Results

Soybean rust was first detected in August 2009 in southeast Arkansas and was confirmed in every soybean production county of the state that year. Soybean sentinel plots in 30+ counties were monitored for the disease in 2010. No samples were positive for the disease in 2010 due to abnormally hot, dry conditions.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants

- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #39

1. Outcome Measures

- Not Reporting on this Outcome Measure
of clientele who reported knowledge gained

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

- Change in Knowledge Outcome Measure
- Change in Action Outcome Measure
- Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	524

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Honey bee populations have been declining across the country. Beekeeping is at risk of becoming a "graying" enterprise if new beekeepers are not recruited and trained. Increasing the number of people maintaining healthy honey bee colonies will eventually increase

population of honey bees in the wild as well.

What has been done

Honey Education Short Courses were presented in 10 locations around the state. The courses were designed to present information on practical beginning beekeeping in an easy*to*understand format, and encourage participants to begin keeping bees themselves.

Results

About 500 participants came to the classes. Experienced beekeepers seeking to expand their knowledge and new beekeepers or those who were not yet beekeepers attended. A total of 19% of participants filled out an evaluation form at the end of the course. Overall, 71% of respondents, 99% indicated that they planned to begin keeping bees in the future, and 86% of these indicated that the course had positively influenced their decision to do so.

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals
- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #40

1. Outcome Measures

Not Reporting on this Outcome Measure

of clientele who initiated an alternative enterprise, as self reported

2. Associated Institution Types

1862 Extension

1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

Change in Action Outcome Measure

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	15

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water
- 112 - Watershed Protection and Management
- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 203 - Plant Biological Efficiency and Abiotic Stresses Affecting Plants
- 204 - Plant Product Quality and Utility (Preharvest)
- 205 - Plant Management Systems
- 213 - Weeds Affecting Plants
- 215 - Biological Control of Pests Affecting Plants
- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 303 - Genetic Improvement of Animals

- 305 - Animal Physiological Processes
- 306 - Environmental Stress in Animals
- 307 - Animal Management Systems
- 308 - Improved Animal Products (Before Harvest)
- 311 - Animal Diseases
- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other

Brief Explanation

External factors that impacted outcomes included the following: 1) Program realignment impacted efforts expended in several of the listed programs within the new Global Food Security and Hunger initiative; 2) Several state defined outcomes were moved from the Food, Nutrition and Health State Planned Programs to the Global Food Security and Hunger initiative; 3) A reduction in staff (FTEs), which reduced the amount of programming in several counties, had a negative impact on program delivery for this area.

Global food production outcomes were influenced by market conditions, including the fuel versus food pressure, changes in payments to farmers, increased production input costs, land grant university funding, the downturn in the economy, and as always weather conditions. Any or all of these factors could cause projected outcomes to vary widely.

V(I). Planned Program (Evaluation Studies and Data Collection)

(OPTIONAL SECTION)

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)

- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.
- Comparison between locales where the program operates and sites without program intervention
- Other

Evaluation Results

The Division of Agriculture faculty developed, evaluated, and disseminated needs-based programs that focused on boosting agricultural production to meet growing food demand and to reduce food insecurity within vulnerable populations.

The Expanded Foods and Nutrition Programs were conducted within thirteen counties with a high percentage of Supplemental Nutrition Assistance program participants. Program Assistants are used to conduct one-on-one and group training with individuals falling within the parameters of the program. There is a series of twelve lessons used by staff that focused on food budgeting, healthy lifestyles, healthy food consumption, meal planning, and nutritious food preparation. The target population for the program: Single women, African-Americans and Hispanic individuals and families, and children of families receiving supplemental nutrition assistance.

1769 EFNEP participants reported they were comparing prices before they purchased food as a result of completing the nutrition education program.

1109 (63%) of EFNEP graduates thought about healthy food choices when deciding what to feed their families.

1249 (71%) of EFNEP graduates more often planned meals in advance.

1106 (71%) of EFNEP graduates used a list for grocery shopping.

1159 youth from 69 groups reported eating a variety of foods.

A state-wide survey was conducted asking livestock producers their most preferred methods for receiving information from Extension, direct methods were not ranked very high. Indirect methods, however, were ranked high. These results provided the impetus for developing electronic newsletters. The actual number of indirect contacts adults was above target due to concerted effort to establish electronic newsletters in the area of beef cattle production, dairy cattle production, small ruminates production, forage and grazing management production.

The number of on farm demonstrations was much higher than expected. This was due to a special program called "300 Day Grazing" which demonstrated research based practices to reduce the dependences of harvest forages. In 2009 over 70 300 Day Grazing demonstration were implemented alone.

The number of producers who actually initiated or improved record keeping was

higher than expected. The increase was due to more producers keeping both financial and production records. Both types of records are important and play key roles in managing a livestock operation.

Yields in corn, soybean, and rice verification fields that used UA Division of Agriculture recommendations were compared to state averages. The overall rice yield potential has increased by an average of 83 lbs/acre each year. The contribution of genetic gain to this yield increase is 47 bushels/acre. Considering more than 50% of the rice acreage in Arkansas is planted to cultivars developed by the University of Arkansas Breeding Program, this contribution has resulted in an additional 429 million dollars additional farm income over this 20-year period. Four new cultivars were released in 2009 by the University of Arkansas that is anticipated will continue the major impact on the rice industry in the Southern USA. 'CL 142 AR' and 'CL 181 AR' appear to provide an additional 4% in yield potential compared to similar cultivars. It is also expected that 'CL 142 AR' may be produced on as much as 25% of the acreage in 2011. Data on shifts in production technology, acreage, cropping systems, and enrollment were compared to historic levels and trends. The data shows that the yield levels of these crops increased.

Key Items of Evaluation

Betty G. enrolled in the Expanded Food and Nutrition Education Program in March 2009. After successfully graduating from the program she was able to secure a position in a community restaurant. Betty G. indicated that her knowledge of portion sizes, food safety and meal planning helped her get the position of head cook. She accredits this success to what was learned through EFNEP (Lee County).

"An EFNEP participant and her family had been having money problems with the state of the economy and not enough work for the husband. Their 3-month-old infant had to be hospitalized. Through EFNEP the participant learned to read labels and choose good quality foods by using generic brands and reading sale ads. She began to plan meals for the week and make menus. Now they do not run out of food and are able to save up to \$50 each month on food. As a result of saving money on food they have been able to pay on some of their debts such as the hospital bill," Sandra Guzman, EFNEP Program Assistant, Benton County. An EFNEP participant said that "Learning that I need healthy snacks between meals has been a blessing. It has definitely decreased the number of blackouts I was having," (Benton County).

The overall rice yield potential has increased by an average of 83 lbs/acre each year. The contribution of genetic gain to this yield increase is 47 bushels/acre. Considering more than 50% of the rice acreage in Arkansas is planted to cultivars developed by the University of Arkansas Breeding Program, this contribution has resulted in an additional 429 million dollars additional farm income over this 20-year period.

Four new cultivars have been release in 2009 by the University of Arkansas that is anticipated will continue the major impact on the rice industry in the Southern USA. 'CL 142 AR' and 'CL 181 AR' appear to provide an additional 4% in yield potential compared to similar cultivars. It is also expected that 'CL 142 AR' may be produced on as much as 25% of the acreage in 2011.

Applied research and field trials conducted by Division of Agriculture Poultry faculty identified unsuitable energy technologies as well as problems with drinking water treatment, litter processing and feed delivery technologies. Information gained from applied research and field trials was shared with allied industry representatives through a variety of delivery methods. Observations indicated increased knowledge of drinking water treatment and litter processing technologies. In addition, technology adoption rates were estimated at 15%, resulting savings of approximately \$6.3 million.