2011 University of Arkansas Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

The University of Arkansas (UA) Division of Agriculture faculty, staff and facilities are located on five university campuses, at five regional Research and Extension Centers, seven Research Stations, and 75 county Extension offices. The UA Division of Agriculture remains committed to this statewide infrastructure with a presence in all 75 Arkansas counties; ensuring that researchers and Extension educators are readily available to address the science and business of agriculture, as well as the broader needs of families and the communities we serve.

The UA Division of Agriculture engaged a large number of stakeholders (including individual clientele, producers, schools, partner agencies and organizations, state government officials, community leaders, underserved groups, and legislators) in the design and development of the 2011-2015 Strategic Plan. Based on stakeholder feedback, the Division identified five emphasis areas which include: Agricultural Production and Processing; Environment, Energy and Climate; Access to Safe and Nutritious Food; Increasing Opportunities for Families and Youth; and Economic and Community Development.

The five emphasis areas are further broken down for planning and evaluation into 11 Planned Programs, which includes: Childhood Obesity; Climate Change; Community and Economic Development; Families and Youth; Food, Nutrition and Health; Food Safety; Global Food Security and Health-Animal Related; Food Safety; Global Food Security and Health-Plant Related; Natural Resources and Environment; Plant and Plant Products-Non-Food Related; and Sustainable Energy.

The investment of Division of Agriculture resources and energy in providing research-based information and opportunities for producers, communities, industry, families and youth is an investment in our future. Producers and processors of agricultural commodities, who create one in every six jobs in Arkansas, rely on the Division of Agriculture to help solve problems and create new opportunities. The Division's Agricultural Experiment Station scientists and Cooperative Extension Service specialists and county agents partner with producers, processors and agribusinesses. Our research and education programs include basic and applied research in a variety of scientific disciplines with practical applications under local Arkansas conditions. The Division helps the Arkansas agriculture industry fulfill its roles of being a major contributor to the state's economy, being a good steward of our natural resources and remaining a sustainable producer of food and fiber for the state, the nation and the world.

Arkansas faces many challenges, with the second highest divorce rate in the nation, costing taxpayers more than $500 million annually. The state ranks near the bottom at 47th nationally, in a new state-by-state study on the well-being of America's children. These and other issues, including an aging population, chronic disease, and economic stress pose challenges for the families, youth and communities we serve.

In 2011, local 4-H clubs across Arkansas involved young people in hands-on educational and service programs that enhanced life skills, such as decision-making, leadership and communication. The Division of Agriculture likewise partnered with communities, schools and other agencies to address major problems such as childhood obesity and the lack of jobs in economically distressed areas.

2011 Division of Agriculture Planned Program Impact Highlights Include:

Global Food Security and Hunger: Animal Related

Since the cost of feed, fertilizer and fuel have increased, the goal of the 300 Day Grazing Program is to implement management changes to enhance the utilization of grown forages and reduce dependency on fertilizer, supplemental feed and fuel. NRCS used the results of the 300 Day Grazing Program as a foundation to revise EQIP programs and develop the Prescribed Grazing cost share practice.Total direct savings to Arkansas producers for the three year period was $191,727.

Division of Agriculture research has shown that producers having predominantly toxic fescue pastures for their cows should consider a fall-calving season if the emphasis is on weaning weights. This may be particularly important to those developing replacement heifers, as options for rapid development of fall-born heifers to calve at two-years of age.

With reduced availability of chemical and antimicrobial agents for control of diseases, animal agriculture in the U.S. is increasingly in need of sustainable solutions for the control of infectious diseases. Importantly, for poultry and other agricultural animals, the ability to protect animals against an increasingly complex array of pathogens through inexpensive vaccination is greatly needed. Scientists in the Division of Agriculture's Center for Excellence for Poultry Science have developed a novel, innovative vaccine using a bacterial vector that is Generally Recognized as Safe (GRAS) to present highly conserved, antigenic molecules to bird populations in a cost effective oral method. Current vaccine candidates include vaccines against Salmonella + Campylobacter, E. coli, Eimeria spp. and avian influenza. In 2010-2011, the patent-pending vaccine platform was licensed to a commercial investor for feasibility studies, regulatory approval, and commercial development.

The impact of an effective and low cost oral vaccine platform will be profound in the poultry industry, but the long term impact could be immeasurable if successful control of food-borne pathogens and reduced risk of poultry-mediated transmission of zoonotic diseases, such as highly pathogenic avian influenza, are achieved. Ongoing discussions for commercialization of several aspects of this platform with a major U.S.-based biologics manufacturer are in progress.

Global Food Security and Hunger: Plant Related

Faculty from the Division of Agriculture developed, evaluated, and disseminated need-based programs that focused on boosting agricultural production to meet growing food demand and to reduce food insecurity. Of the rice grown in Arkansas in 2011, 21% consisted of varieties developed in the Division of Agriculture Arkansas rice variety improvement program. Yields in 2011 were 6840 lbs/acre versus 4,110 lbs/acre when the program began in 1980. Estimating that 60% of the value of that yield increase was due to new varieties, the average monetary gain in 2011 represented $375/acre or $434 million total for the 1.155 million acres of rice harvested in Arkansas in 2011.

Yields in corn, soybean, wheat, and rice verifications fields that used UA Division of Agriculture recommendations exceeded state averages. For example, yields in the corn verification program averaged over 180 bu/acre, versus the state average of 142 bu/acre. The yield increase in the verification program was due to proper hybrid selection, planting rates, adequate fertility, weed control, and irrigation. The increased yields represented an increase of $247/acre gain in gross revenue compared to state average fields. These results show that corn producers can increase profits by following University of Arkansas Division of Agriculture recommendations, which is important due to the expansion of corn acreage in Arkansas.

Arkansas crop growers were provided significant education and support for crop production. A new patent for using digital imaging to determine nitrogen levels will result in better use of fertilizers. There were 780 demonstrations of research conducted on-farm, in addition to 337 row crop field days related to

food production. Other support included 457 education meetings and 12,557 farm visits related to food crop production. The educational classes, workshops, group discussions, one-on-one interventions and demonstrations were provided to 197,130 constituents. Surveys conducted of meeting attendees indicated increased learning about IPM methods and incorporating the methods learned at meetings into crop production practices. A total of 5,095 clients used scouting programs and 591 pest monitoring traps were utilized to make decisions about appropriate use of pesticides. Pest management methods were important in increasing crop yields.

Specialty crops, such as pecans, represent an area with great potential for agriculturists in the state. The difficulties associated from growing a new crop include a lack of knowledge about production practices and recommended practices in the areas of pest management, orchard management, economics, and food safety. A grower survey gave a comprehensive picture of current practices, including management, nutrition, and processing, pests, and nutritional status of orchards. Educational activities were coordinated with the Arkansas Pecan Grower Association to help tailor the information growers deemed necessary to their farming operations. Education about pecan nut casebearer, for example, led to reductions in insecticide applications, or to applications that better targeted the pest. A pecan degree-day accumulation model for this pest is available to growers on the UA Cooperative Extension Service webpage.

Future specialty crops were aided with patents on a new table grape and a new variety of blackberry. Arkansas beekeepers were supported through numerous workshops and training sessions. More than 6,000 Arkansans learned about beekeeping practices, the importance of pollination and honeybee health. The increased awareness of bees will lead to better pollination and increased crop yields, particularly of fruit and other specialty crops.

Finally, improved nutrition practices, as a result of 2,281 Extension education classes, workshops and demonstrations helped improve the health of Arkansans. Those educational methods were provided to 33,361 food and nutrition clients. There were 2,146 participants who adopted at least one positive nutrition practice, and 1873 who indicated that they intended to adopt one or more healthy food/nutrition/resource management practice. The nutrition education program resulted in 1,922 participants who reported they less often ran out of food before the end of the month, thus resulting in better family health and nutrition.

Plant and plant products: Non-food Related

During 2011, interest in locally produced food and non-food plant products continued to grow in Arkansas and local suppliers were able to capitalize on this demand. Particular increases were seen for greenhouse products. Division of Agriculture collaborative efforts continued through assistance with the development of new non-food plant product enterprises and through support of the growth of existing firms producing non-food plant products.

Cotton management systems are critical to help producers who are often challenged to find varieties/hybrids that will perform well on their farm due to the large volume of varieties/hybrids available. In 2011, 75 cotton varieties were tested in the Arkansas Variety Testing program. The Cotton Research Verification Programs demonstrated in 2011 that variety selection and optimum timing of inputs can improve income by an average of $100 per acre. Average cotton yields over the four-year period were increased by 80lbs of lint per acre when irrigation was initiated one week prior to bloom. The optimum time to terminate irrigation was found to be 450 heat units following cutout (node above white flower 5), unless irrigation was delayed until bloom which resulted in 600 heat units following cutout as the optimum time to terminate irrigation. In 2011, the cotton yield increase resulted in an $80/acre increase in profitability.

The Arkansas Master Gardener (MG) program continued to grow in 2011, with 3,116 members in 65 counties. These Master Gardeners reported 163,448 volunteer hours. The Governor of Arkansas annually recognizes volunteer organizations across the state. UA Division of Agriculture placed third among

Arkansas state agencies this year. Arkansas is taking the lead in MG leader training, with other states adopting our agendas and educational content.

Natural Resources & Environment

Natural resource and environmental stewardship has been a long standing program of the UA Division of Agriculture. Workshops, short courses, meetings, publications, and field days will continue as touchstones of the program. As access to technology expands, program delivery via the web, satellite and other electronic media is also being utilized. County Extension agents, located in each county of the State, are central to natural resource efforts, as well. County agents developed and delivered meetings, workshops, and field days focused on issues important to their local clientele and leadership. UA Division of Agriculture faculty will continue to work closely with county level programs, as well as with stakeholders at the State level to identify and implement research and extension programs.

For the 2011 reporting year there were 23,243 direct and 189,378 indirect contacts documented for the natural resources and environment related efforts. There were also 41 research and 21 extension publications. The extension publication numbers do not include the numerous newsletters, handouts, news stories generated in support of this critical program effort.

A key component of the Natural Resources and Environment planned program is the Arkansas Forest Resources Center. The goal of the Arkansas Forest Resources Center is to develop and deliver programs in research and extension that enhance and ensure the sustainability of forest-based natural resources. A part of this effort resulted in over 4000 individuals reporting an increase in knowledge via landowner education programs. This is complemented by over 490 professional foresters maintaining their certifications utilizing Division of Agriculture educational programs.

The UA Division of Agriculture continues to deliver a nutrient management certification training program. A core component of this program is the Arkansas Phosphorus Index that was developed and is being implemented as a collaborative effort of the university, governmental agencies and industry groups. As a result of Division of Agriculture training, 155 professionals maintained their certification. Utilizing their training and the new Phosphorus Index they revised nutrient management plans for 197 farms with over 14,500 combined acres.

The Arkansas Discovery Farms are the most recent venue for researching, documenting, and demonstrating the effectiveness of best management practices for practical farm land management. A significant portion of this effort is manure management, as it is a critical component of sustainable livestock and associated crop production operations. Improper manure management increases risks to the environment. The Division also provides research and Extension efforts in the developing areas of bio-energy and air emissions.

Climate Change

Agriculture is often cited as a major source of greenhouse gases (GHGs). However, agricultural practices can reduce the emission rate of GHGs and, in certain cases, can also result in a net sink for carbon. The demand for food, feed, fiber and fuel from agriculture is expected to increase dramatically in order to meet the global needs of 9 billion-plus people by 2050. This demand will require increased production from traditional forest and farmland or alternatively, place rainforests, wetlands, and prairies at risk. Increasing production will require improved management of water, energy, fertilizer, genetics, pest management, transportation, storage, packaging and emerging technology. Yet, the complex nature of the agricultural supply chains has thwarted efforts in measuring sustainability. Currently there is a deep fragmentation of knowledge across supply chains.

In response to this fragmentation, the Center for Agricultural and Rural Sustainability (CARS), involving a multi-disciplinary team of scientists, educators and engineers, was created in 2007 to

coordinate the Division of Agriculture's research, outreach, and education efforts in sustainability. CARS has developed methods of measuring and reducing greenhouse gas (GHG) emissions from agricultural production, processing, and distribution practices. CARS pioneered use of life cycle analyses (LCAs) in US agriculture using high spatial resolution data for three major agricultural areas: a dairy LCA for liquid milk, a cotton LCA for GHG emissions, and a Pork LCA. All three are cradle to grave, comprehensive and geographically explicit LCAs.

CARS is focusing on direct quantification of GHG emissions from rice; assessments of soil carbon storage and sequestration; and evaluations of potential economic impacts of various production practices based on their carbon footprints and how policy may affect production in Arkansas. Collectively, these efforts are focused on generating knowledge of agricultural systems that maintain high productivity in the face of climate changes and reduce greenhouse gas emissions and on helping producers plan and adapt to changing environments. The underlying assumptions regarding sustainable practices include: 1) sustainability is best measured by continuous improvement rather than a standard; 2) sustainability retains profitability across the supply chain and; 3) climate change mitigation technologies must be broadly and easily adopted across the supply chain.

Arkansas is the nation's leading producer of rice. Rice production is a major consumer of nitrogen in Arkansas. Division of Agriculture scientists have developed a novel soil test for rice producers called N-STAR, a superior prediction model of nitrogen needs of rice grown on silt loam soils in Arkansas. Adoption of N-STAR should increase nitrogen use efficiency in many rice fields may reduce nitrogen application rates may on many rice fields. The principles involved in creating N-STAR are scheduled to be tested on clay soils for rice, for corn production and for wheat production.

Sustainable Energy

The Energy Independence and Security Act of 2007 requires US biofuels production to increase to 36 billion gallons by 2022. Of that total, the majority (21 billion gallons) must be derived from advanced biofuels, such as cellulosic ethanol and biomass-based diesel. The remaining 15 billion gallons may be made from conventional feedstocks, such as corn and sugarcane. Arkansas is well-positioned for bioenergy production, with large areas of cropland and forest and an innovative processing industry for agricultural and forest products.

The University of Arkansas Division of Agriculture has made significant investments in sustainable energy, including biodiesel fuel production, biomass crop production and public issue education. UA Division of Agriculture faculty work together to conduct field-based research about potential crop and fast growing tree species that show good potential for bioenergy production. However, reaching the sustainable energy goals outlined by the Federal government involves not only production of biomass and bioenergy product testing, but also policy analysis, issue education, and understanding public perceptions about sustainable energy. Managing potential biomass crops can impact the environment, especially if increased applications of fertilizer and pesticides are required. UA Division of Agriculture faculty members worked across several disciplines in 2011 to investigate the potential impacts of biomass production and biofuel use on water quality, forest sustainability, soil nutrients, and other environmental concerns to help Arkansans understand the benefits and costs of biofuel production.

The sustainable energy program is an essential integrated research and extension program that keeps Arkansans, including row crop and livestock producers, up-to-date on the state of sustainable energy research, policy, and applications. The goal is to contribute to energy independence by investigating and designing optimum forest products and crops for bioenergy production and testing of bioenergy products, while ensuring sustainable and adaptive management practices.

There is a need to find synergy between existing biomass streams while developing new streams. UA Division of Agriculture research programs are exploring additional existing biomass sources,

are seeking to develop those that are suitable for useable biomass streams and are exploring new sources of biomass. This is done while working to maintain the integrity of existing streams and supporting the current bioenergy-related industry, without negatively impacting the existing agriculture industry and land mass. The State of Arkansas and its agronomic, economic, and business-related resources are well positioned to meet this challenge.

In 2011, educational direct-contact workshops were presented to at least 1965 adults and 309 youth. There were eight bioenergy crop demonstrations at research field days, providing information on at least five research-related projects on sustainable bioenergy crops and bio-energy products testing. A total of 12 peer-reviewed research articles were published related to sustainable energy, in addition to four Extension publications.

Food, Nutrition and Health

The Strong Women program is a strength-training program specifically for midlife and elderly women. The program helps women to increase their strength, increase their bone density, increase their balance, and increase their energy. The total participation contacts have increased from 18,654 in 2007 to 40,748 in 2011. 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.

Medication misuse is a serious and growing problem. Prescription drugs are being misused and abused by a wide variety of people. Arkansas is among states with the highest rates of non-medical use of pain relievers among 12 to 25-year-olds. The University of Arkansas Division of Agriculture addresses this issue through the "Be MedWise Arkansas" program, a medication literacy awareness initiative. Educational programs are designed to reach the elderly, caregivers, adults, youth and professionals about issues on drug interaction, storage, misuse, disposal, etc. The primary goal is to help clientele be informed about the effects of prescription drugs and their risk.

Food Safety

The Division of Agriculture continues to have a strong emphasis on food safety with efforts in both basic and applied research and supporting extension efforts for youth, the public and the food industry. In 2011, research efforts were focused mostly on protein foods, with an emphasis placed on basic research on pathogens, such as Listeria monocytogenes, E-Coli and Salmonella. Basic research focused on Salmonella metabolism and genetic regulation of stress responses when grown under processing conditions. In 2011 applied research on microbial decontamination methods and processes made significant strides. For example, the use of antimicrobial treatments in combination with an electrostatic spraying technology was shown to significantly decrease the microbial load of beef trimmings. In addition, Arkansas has several nationally recognized food industries that request food safety training for their employees. These food safety educational programs assist food processing companies to remain nationally competitive and to prevent foodborne illness. One such program is the Better Process Control School, which has certified 2,375 food processing employees since its inception in 1973.

Childhood Obesity:

The Division of Agriculture is leading a statewide project aimed at understanding and arresting the growth of obesity among young children. The project is funded by NIFA and involves innovative research and educational programming designed to bring several complementary interventions to scale, each addressing different aspects of the childhood obesity crisis. Researchers are identifying characteristics of the food environment that contribute most to childhood obesity, so that interventions can target those children most at risk. Statewide partners include: Dale Bumpers College of Agriculture, Food and Life Sciences; the Walton College of Business (UAF-Fayetteville); the UA Medical Science Campus (Little Rock), Arkansas Children's Hospital Research Institute; and the Arkansas Center for Health Improvement.

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, 66% of parents surveyed following the completion of the program reported that their families were eating more fruits and vegetables; 62% of parents consumed more water; and 62% were more active.

Arkansas has responded to the multigenerational obesity problem with several programs encouraging Arkansas families to move more and learn about healthy lifestyles. The Walk Across Arkansas program included 3,285 participants walking a total of 618,151 miles. Improvements in health and well-being were reported as positive outcomes. Based on research stating that 1,000 steps taken saves $1 in healthcare costs, participants contributed to a potential healthcare savings of $61,815 in 2011.

Reshape Yourself, a 15-week program conducted in 8 counties, supports the idea that people of all shapes and sizes can improve health by adopting healthy practices. The program experienced a sixty four percent (64%) graduation rate. The average weight loss was 6 pounds. Sixty-six percent (66%) of participants altered their behavior to follow standard serving sizes and 69% increased their walking activity.

Families and Youth:
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 are trained to teach the five-hour ASI RiderCourse. In 2011, 167 youth and adults participated in the RiderCourse, 221 4-H leaders were trained to use the 4-H Leader's Guide National Classroom Curriculum and over 12,600 Arkansans were reached with the 4-H ATV Safety message. This program is made possible through partnerships with many businesses, state agencies, and other organizations.

The need for quality care for Arkansas's children is greater than ever. To provide the best care possible, Arkansas's child care professionals are required to get a minimum of 10 hours per year of verified training to maintain their licensure. The Division of Agriculture's Best Care, Best Care Connected, and Guiding Children Successfully programs provide Arkansas's child care professionals with the verified training they need. These programs are delivered through Extension's statewide network so they are readily available to Arkansans in all 75 counties. The programs are also available in multiple formats (i.e., face-to-face, online, & self-guided) to accommodate different learning styles and work schedules. In 2011, 4,301 Arkansas child care professionals successfully completed 29,006 hours of training. With an estimated value of $25 per training hour, the Division's child care provider training programs saved Arkansas child care professionals $725,150 in training costs.

Community and Economic Development

Public policy education is the newest formal component of the Division's Community and Economic Development efforts. The Public Policy Center houses the core capacity for this effort and includes both Extension and research responsibilities. The base effort is centered in statewide issue elections and the public understanding of ballot measures whether proposed by the legislative process or public referendum. Citizens are actively engaged through in-depth analysis of issues, that is policy neutral and without the language of advocacy.

Whether driven by economic circumstance or natural disaster, 2011 was a difficult year for Arkansas citizens. Record tornados and flooding in Arkansas seriously impacted the rural economy. Sixteen counties were directly affected by one or both of these natural disaster circumstances. The response from

county extension agents and the Division of Agriculture produced a remarkable partnership of disaster response and recovery. The disaster events produced community based planning efforts designed to build community capacity and resiliency when dealing with future disaster circumstances whether economic or natural in origin. In total the program response resulted in a strong and continuing relationship with our EDEN Network, the Arkansas Department of Emergency Management (ADEM), the Federal Emergency Management Agency (FEMA), and the Southern Rural Development Center.

In 2011 CED programming through the Arkansas Procurement Assistance Center's (APAC) procurement assistance counseling produced more than 65 million dollars in contract value for Arkansas for five hundred client businesses. The federal formula for economic activity related to jobs credits this program with producing more than 1300 jobs in Arkansas. Since 1993, APAC has produced more than 1.1 billion dollars in contract revenue for businesses in the state. The most recent five-year program review shows APAC's return on investment of 142 to 1.

Entrepreneurial development efforts were focused on the potential within the Latino community, individuals interested in e-commerce and 4-H youth interested in starting a business. These programs reached more than 200 participants in 26 Arkansas counties. Participants developed business plans, learned about rules and regulations governing small business, explored financing options available and learned financial management and accounting principles for business.

The Division of Agriculture is currently training its fifteenth class of LeadAR fellows. The current leadership development program class brings the total enrollment of the program, over its 25 year history, to more than 450 people. Alumni of the program continue to be represented in major leadership positions and community development roles across the state, ranging from Speaker of the House of Representatives to the elected leadership of many of Arkansas counties and cities, the LeadAR program continues to pay dividends to the state. The goals of LeadAR participants are many and varied. They establish goals and report to their success throughout the two year fellowship and beyond. Most goals are focused to the benefit of their personal community of interest. The accumulated product of these goals is in the process of being measured. One class alone produced more than $250,000 in local community project investment.

The 2011 Executive Summary showcases only a few examples of the UA Division of Agriculture's impact in support of diverse stakeholders across Arkansas. It should be self-evident that most of the Divisions' efforts are currently multidisciplinary and integrated. We believe that all Arkansans benefitted during 2011 in one way or another from the progress we were able to make in concert with state agencies, commodity boards, communities, organizations, businesses, individuals, and our federal partner. 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 for Agriculture - Extension

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Total Actual Amount of professional FTEs/SYs for this State

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	523.2	0.0	148.8	0.0
Actual	382.8	0.0	482.5	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
- Expert Peer Review

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 was 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 2011 (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 the 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 needs of stakeholders. Following the outside review teams' written evaluation, the department or program prepares a response to the review. The Division of Agriculture and University administration then meet with the department or program faculty one more times to develop a plan for implementing changes. As a result, annual progress is reported to Division and University administration.

An external review was conducted with the Department of Horticulture March 27-31, 2011. The external review committee included: Wayne Mackay, University of Florida (chair); Russell Black, Westwood Gardens; Roch Gaussion, University of Nebraska; Richard Harkess, Mississippi State University; and Brian Whipker, North Carolina State University.

III. Stakeholder Input

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

- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to traditional stakeholder individuals
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder 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 based on the needs identified in a series of regional and statewide listening sessions with current and potential stakeholders representing the diversity of the population in the regions and state. Single issue meetings were held as needed to address emerging issues and 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
- Needs Assessments

Brief explanation.

In 2011 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 agents 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
- Meeting with traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Meeting specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Other (Meeting with regulatory groups, state agencies, & commodity prom)

Brief explanation.

During the summer of 2011, 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 was used to identify research needs. Several priority-setting activities were scheduled during 2011 with specific commodity and 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. The 2011-2015 strategic plan for the Division included input from internal and external stakeholders statewide. A total of 780 internal and 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.

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Extension Programs
- 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 also involved in identification of research needs and priorities.

During the statewide listening sessions in support of our new five-year strategic plan, 172 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 for 2011-2015:

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
5758297	0	4235897	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	4905958	0	4235897	0
Actual Matching	5758297	0	32182972	0
Actual All Other	41558897	0	9452502	0
Total Actual Expended	52223152	0	45871371	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	3319071	0	0	0

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Families & Youth

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	5%		5%	
802	Human Development and Family Well-Being	20%		30%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	20%		40%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	20%		15%	
806	Youth Development	35%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	185.3	0.0	3.6	0.0
Actual Paid Professional	125.5	0.0	6.3	0.0
Actual Volunteer	322.6	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**
1307928	0	9986	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1535162	0	9986	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
11079602	0	348667	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The 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 lifeskills, form attitudes, and practice behavior that will enable them to become self-directing, productive, and contributing members of society.

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

3. How was eXtension used?

We invited Larry Lippke, Moodle Coordinator for the eXtension Initiative, to provide a 2-hour training for all of our FCS state faculty and county extension agents. His presentation focused on the various websites and services that are part of the eXtension online presence, with a particular focus on how we could enhance local Extension programming as well as how Extension faculty could become involved in and contribute to eXtension. As a result of that training, many agents now look to eXtension as a trusted source of research-based program information. In addition, Dr. Laura Connerly has joined and participates in the "Financial Security for All" community of practice.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	97897	245818	280702	97968

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

Patent Applications Submitted

Year: 2011
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	10	6	16

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of organized 4-H Clubs

Year	Actual
2011	775

Output #2

Output Measure

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

Year	Actual
2011	182824

Output #3

Output Measure

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

Year	Actual
2011	84300

Output #4

Output Measure

- Number of non-duplicated participants in 4-H Citizenship programs

Year	Actual
2011	37951

Output #5

Output Measure

- Number of federal grants and contracts

Year	Actual
2011	8

Output #6

Output Measure

- Dollar amounts in 1,000's of federal grants and contracts

Year	Actual
2011	434

Output #7

Output Measure

- Number of non-federal grants and contracts

Year	Actual
2011	8

Output #8

Output Measure

- Dollar amounts in 1,000's of non-federal grants and contracts

Year	Actual
2011	446

Output #9

Output Measure

- Number of participants in individual and family resource management programs

Year	Actual
2011	2082

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of 4-H participants who learned life skill
2	Number of child care providers who increased knowledge through child care provider programs
3	Number of participants who increased knowledge through leadership development programs
4	Number of participants who increased knowledge through parent education programs
5	Number of participants who increased knowledge through marriage education programs
6	Number of participants who increased knowledge through personal development programs
7	Number of 4-H Journals completed
8	Number of volunteer hours contributed through the 4-H program by youth and adults
9	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
10	Number of Refereed Journal Publications
11	Estimated dollar value in thousands of 4-H volunteers
12	Estimated dollar value in thousands of EH volunteers
13	Number of participants who increase their knowledge of individual and family resource management

Outcome #1

1. Outcome Measures

Number of 4-H participants who learned life skill

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	61709

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.

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 19 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

Due to the work of the Arkansas 4-H ATV Safety educational program, in 2011 over 9,515 individuals have been exposed to the 4-H ATV Safety message. This extraordinary effort has resulted in 167 youth and adults participating in the 4 hour ASI RiderCourse and becoming certified safe riders through the Arkansas 4-H ATV Safety Program. Media efforts, including television, radio, and print, have helped us reach an audience of over three million. Numerous partnerships have been established with groups such as Arkansas Children's Hospital, state

agencies, ATV dealerships, and other businesses and organizations to help deliver the program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Number of child care providers who increased knowledge through child care provider programs

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4172

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The need for quality care for Arkansas's children is greater than ever. To provide the best care possible, Arkansas's child care professionals are required to get a minimum of 10 hours per year of verified training to maintain their licensure and 15 hours per year to participate in Better Beginnings (Arkansas's quality approved rating system).

What has been done
The University of Arkansas Cooperative Extension Service's child care provider training programs (Best Care, Best Care Connected, and Guiding Children Successfully) provide Arkansas's child care professionals with the verified training they need free of charge. All programs are research-based and developed by subject matter specialists in the areas of child development, nutrition, health and safety, resource management, and youth development. These programs are delivered through Extension?s statewide network so they are readily available to Arkansans in all 75 counties. Our programs are available in multiple formats (i.e., face-to-face, online, & self-guided) to accommodate different learning styles and work schedules.

Results
*In 2011, with a budget of $343,979 for all three programs, 4,301 child care professionals successfully completed 29,006 hours of training, a calculated cost of $11.86 per training hour.
*With an estimated value of $25 per training hour, our child care professional training programs saved Arkansas child care professionals $725,150 in training costs in 2011.
*Participants had statistically significant increases ($p < .001$) in their levels of understanding of all lesson topics after participating in the training.
*97% indicated their knowledge of effective child care practices increased, 91% planned to do something new to be a better child care professional, and 86% actually changed at one month follow-up as a result of program participation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #3

1. Outcome Measures

Number of participants who increased knowledge through leadership development programs

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of participants who increased knowledge through parent education programs

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	993

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #5

1. Outcome Measures

Number of participants who increased knowledge through marriage education programs

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	537

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #6

1. Outcome Measures

Number of participants who increased knowledge through personal development programs

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1692

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being

Outcome #7

1. Outcome Measures

Number of 4-H Journals completed

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1482

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #8

1. Outcome Measures

Number of volunteer hours contributed through the 4-H program by youth and adults

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	671084

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #9

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

Number of Refereed Journal Publications

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

Estimated dollar value in thousands of 4-H volunteers

2. **Associated Institution Types**

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	14334

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
806	Youth Development

Outcome #12

1. Outcome Measures

Estimated dollar value in thousands of EH volunteers

Not Reporting on this Outcome Measure

Outcome #13

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2082

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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 prices are rising faster than overall inflation. 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.

What has been done

The University of Arkansas Cooperative Extension Service delivered a variety of non-formal educational programs thought Arkansas to help individuals and families gain the knowledge and skills necessary to increase their financial security.

Results

More than 2000 individuals indicated that they increased their knowledge of personal financial management practices by participating in Extension programs including Navigating Your Financial Journey, Coupon College, Stretch Your Dollar, and more. 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.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Child Care Professional Training Results: (To evaluate the effectiveness of our child care professional training programs we use a post then retrospective pre-test design with follow-up)

*In 2011, with a budget of $343,979 for all three programs, 4,301 child care professionals successfully completed 29,006 hours of training, a calculated cost of $11.86 per training hour.

*With an estimated value of $15 per training hour, our child care professional training programs saved Arkansas child care professionals $435,090 in training costs in 2011.

* Analysis from paired samples T-tests revealed that participants had statistically significant increases ($p < .001$) in their levels of understanding of all lesson topics after participating in the training.

*97% indicated their knowledge of effective child care practices increased, 91% planned to do something new to be a better child care professional, and 86% actually changed at one month follow-up as a result of program participation.

Key Items of Evaluation

* Number of participants trained and hours completed
* Increase in knowledge
* Intent to change behavior
* Actual behavior change at follow-up

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Community & Economic Development

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	10%		0%	
602	Business Management, Finance, and Taxation	10%		20%	
604	Marketing and Distribution Practices	10%		10%	
608	Community Resource Planning and Development	20%		20%	
610	Domestic Policy Analysis	10%		15%	
802	Human Development and Family Well-Being	10%		0%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	15%		20%	
805	Community Institutions, Health, and Social Services	10%		15%	
806	Youth Development	5%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	32.1	0.0	9.0	0.0
Actual Paid Professional	38.0	0.0	23.6	0.0
Actual Volunteer	271.0	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**
547996	0	368130	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
643202	0	1043260	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
4642129	0	610575	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

PLEASE NOTE: Program results for the output measures and outcome measures related to individual and family resource management and agricultural economics associated with food production have been removed from this program and added to other planned programs in the University of Arkansas Combined Research and Extension Report of Accomplishments. Results for thos measures are reported in those programs.

****

The University of Arkansas Division of Agriculture's Community and Economic Development program includes a broad array of Research and Extension efforts. The research effort includes: entrepreneurship in Arkansas's hispanic community; the effect of change in healthcare availablilty to rural communities; disaster resiliency and response; and state and local tax and intergovernmental cooperation policy. The extension and outreach efforts include: youth and adult entrepreneurship training; leadership development at both the state and local levels; planning for disaster response and recovery; resource development planning and asset mapping for rural communities; envrironmental and tax policy analysis and education; individual business counseling and support in government contracting through the Arkansas Procurement Assistance Center (APAC);and ballot issue education.

Community and Economic development faculty are involved in both state based and regional efforts in cooperation with the Southern Rural Development Center. The newest effort is the initiation of the SET (Stronger Economies Together) program in Arkansas. This year was a base planning year for the state, establishing the appropriate networks, building a working relationship with USDA RD and engaging pilot communities. Faculty also participates in Southern Regional teams and projects associated with water policy and the Kettering Foundation-based "Turning the Tide on Poverty." Finally, faculty provide policy research and education support for the Division's initiatives in sustainability, alternative energy and environment (primary focus includes water quantity and quality).

2. Brief description of the target audience

The Division of Agriculture's Community and Economic Development Program audience includes:
Local, regional and state leaders - business, non-profit and elected
Hispanic business and community leaders and entrepreneurs
4-H Youth entrepreneurs
Elected officials at all levels of government
Emergency response, planning and recovery, agency personnel and volunteers
Individual business owners
Community development professsionals

Professional tax and financial consultants
Voters
Agriculture and natural resource managers

3. How was eXtension used?

eXtension was used as a resource in alternative energy policy assessment and energy conservation education efforts. Other uses of eXtension were primarily informative and in our state-based planning processes.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	60591	273087	4020	652

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

Patent Applications Submitted

Year: 2011
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	8	12	20

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.

Year	Actual
2011	49

Output #2

Output Measure

- Number of scientific publications.

Year	Actual
2011	3

Output #3

Output Measure

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

Year	Actual
2011	80

Output #4

Output Measure

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

Year	Actual
2011	19910

Output #5

Output Measure

- Number of participants in individual and family resource management programs.
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Number of non-food product related alternative agricultural systems education classes, workshops, group discussions, and other educational events.

Year	Actual
2011	4

Output #7

Output Measure

- Number of alternative agricultural systems demonstrations (e.g., demonstration study farm, plots, etc.) not related to food products.
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Number of Disaster/Emergency Preparedness, Response and Recovery planning and post disaster educational events.

Year	Actual
2011	17

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants who increase knowledge of Community and Economic Development.
2	Number of participants who indicate a change in behavior based on what they've learned about Community and Economic Development.
3	Number of jobs created or retained through educational programs (APAC).
4	Dollars of revenue generated by businesses as a result of educational programs (APAC).
5	Number of participants who increase their knowledge of individual and family resource management.
6	Number of participants who increase knowledge of Agricultural Economics and Agribusiness.
7	Sustainable, vibrant and globally competitive agricultural sector for Arkansas as indicated by Arkansas Cash Farm Receipts (in thousand dollars) (NASS)
8	Sustainable, vibrant and globally competitive agricultural sector for Arkansas as indicated by Arkansas Net Farm Incomes (in thousand dollars) (ERS)
9	Number of clientele who reported knowledge gained about non-food alternative agricultural products.
10	Value of non-food alternative agricultural products ($1000).
11	Number of acres utilized for non-food alternative agricultural products.
12	Number of clientele who initiated an alternative agricultural enterprise with non-food products.
13	Number of farms selling non-food alternative agricultural products or services using various methods.
14	Number of clientele who used program information to decide NOT to initiate an alternative agricultural enterprise with non-food products.
15	Number of participants who increased knowledge through leadership development programs
16	Estimated dollar value of EH volunteers(approx. 350,000 hours donated)
17	Number of county emergency response teams that used Extension information and personnel for preparedness and post disaster response

18	Number of individuals who gained Continuing Professional Education credits from participation in Extension's Income Tax School program

Outcome #1

1. Outcome Measures

Number of participants who increase knowledge of Community and Economic Development.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	8704

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Rural communities and local areas are experiencing substantial change. Extension resources are used in a number of ways to assist communities as they adapt to a changing economic and social environment. One specific issue is that of involving the increasing Latino population in community leadership and economic development. Latino entrepreneurs face specific challenges and obstacles, such as trust, language, regulations, and available financing.

What has been done
The project identified and analyzed barriers by interviewing 171 participants in the language of their choice. Participants represented 220 Latino owned businesses in 26 urban and rural counties. Training and resource materials were designed based on these interviews. They were then used to conduct two workshop series. Topics included in the workshops included business organization and planning, accounting, and cash flow. Workbooks and planning guides were distributed through our 75 county offices, economic districts, and public libraries. Evaluation continues.

Results
Twenty six Latino business owners or potential owners attended at least one of the workshops. Programs were conducted in Spanish, reaching Latino entrepreneurs who otherwise would not have benefited. Many met with local officials, who listened to their concerns and discussed solutions, strengthening their relationships. Evaluations indicated that participants and local officials increased their understanding of practical business skills and local policy processes. They rated the program and materials very highly and indicated an interest in further training.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
608	Community Resource Planning and Development
610	Domestic Policy Analysis
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services
806	Youth Development

Outcome #2

1. Outcome Measures

Number of participants who indicate a change in behavior based on what they've learned about Community and Economic Development.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3106

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Community Leaders are seeking direction and assistance for revitalizing core areas of their communities. Issues like vacant store buildings, declining retail sectors, and business district traffic congestion are general concerns, and are especially important in rural Arkansas. Community leaders are concerned about quality of life issues and want their towns to be bicycle and pedestrian friendly.

What has been done
The communities of Harrison, AR and Mansfield, AR have taken major steps to engage citizens and evaluate assets. The communities were involved in regional investigations of development alternatives. Leaders from six communities in two states participated in a two-day road trip that

connected them to new ideas.

Results
Harrison developed a community wide organization to conduct assessments addressing destination, retail, quality of life, and marketing issues. Over 300 citizens were involved in a community wide survey, and more than 100 people participated in three public planning meetings. Their efforts resulted in a $75,000 grant from the Arkansas highway department. They changed municipal policy, taking maintenance responsibility for their main street. This allowed them to create a 'road diet', narrowing traffic lanes and adding bike/ped facilities. This resulted in lower traffic congestion, greater bicycle and pedestrian access to the business district, and increasing retail activity. Harrison received an Innovative Program Award from the Arkansas Community Development Society in 2011.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
608	Community Resource Planning and Development
610	Domestic Policy Analysis
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services
806	Youth Development

Outcome #3

1. Outcome Measures

Number of jobs created or retained through educational programs (APAC).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1313

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Identifying new market opportunities is an important task for most businesses. This is particularly important in periods of economic downturn. One extremely large potential market is government. Local, state, and federal governments spend hundreds of billions of dollars each year. Many of the products and services government buys are produced within Arkansas, creating market potential. However, navigating the world of government contracting can be difficult and overwhelming for businesses with limited experience doing so.

What has been done

APAC operates under a Cost-Sharing Cooperative Agreement with the Department of Defense, with additional matching support from our third-party sponsors. Our mission is to provide training and resources that help Arkansas businesses generate revenue and thereby create or retain jobs for Arkansas through government contracting. We offer free counseling, consulting, and workshops to Arkansas businesses on issues related to selling goods or services to entities of government. More than 500 counseling sessions were conducted in 2011.

Results

The business clientele base supported by the APAC program produced or retained over 1300 jobs for Arkansans based on DoD's criteria of $50,000 in contract services per job generated.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

Outcome #4

1. Outcome Measures

Dollars of revenue generated by businesses as a result of educational programs (APAC).

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	65652684

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Identifying new market opportunities is an important task for most businesses. This is particularly important in periods of economic downturn. One extremely large potential market is government. Local, state, and federal governments spend hundreds of billions of dollars each year. Many of the products and services government buys are produced within Arkansas, creating market potential. However, navigating the world of government contracting can by difficult and overwhelming for businesses with limited experience doing so.

What has been done
APAC's mission is to provide training and resources that help Arkansas businesses generate revenues and create or retain jobs through effective government contracting. To achieve this, we offer free counseling, consulting, and workshops on issues related to selling goods or services to public agencies. We also provide bid-matching, bid-opportunity listings, and bi-weekly client briefings. We provide access to government specs, drawings, procurement history and other difficult-to-find data through a public access-computer workstation.

Results
APAC has a current client base of 559 businesses. Our programs have reached 1614 attendees at various events, including 60 small business enterprises. This resulted in a total of over 340 contract awards and 50 sub-awards for a gross contract value of more than $65,000,000 in the past year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

Outcome #5

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

Number of participants who increase knowledge of Agricultural Economics and Agribusiness.

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Number of clientele who reported knowledge gained about non-food alternative agricultural products.

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	87

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There's a growing interest in agritourism in Arkansas. A recent report on agritourism operators in Arkansas showed a rise in income among successful agritourism businesses but a drop in the overall number of operations statewide. Not all agritourism ventures are successful, yet among those that are, there are some common characteristics that might serve as examples to the others.

What has been done
The state's first-ever agritourism conference was held in 2011. Designed around the results of a recent survey that indicated the educational needs of agritourism business owners, the program focused on such important topics as marketing and branding, roadside sign laws, legal liability issues, social media, and working with school groups. There were built-in opportunities for professional networking, where proprietors could share their experiences and advice with each other in an informal way.

Results
Nearly 100 members of the agritourism industry filled the conference rooms at the July meeting. Discussion in the sessions was both scholarly and practical, as was the discussion during the informal networking functions. A post conference evaluation indicated participants' desire for more similar workshops in the future plus some other experiential learning opportunities, including regional farm tours, podcasts, and webinars.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
608	Community Resource Planning and Development
610	Domestic Policy Analysis
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services
806	Youth Development

Outcome #10

1. Outcome Measures

Value of non-food alternative agricultural products ($1000).

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

   Number of acres utilized for non-food alternative agricultural products.

   Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

   Number of clientele who initiated an alternative agricultural enterprise with non-food products.

   Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

   Number of farms selling non-food alternative agricultural products or services using various methods.

   Not Reporting on this Outcome Measure

Outcome #14

1. **Outcome Measures**

   Number of clientele who used program information to decide NOT to initiate an alternative agricultural enterprise with non-food products.

   Not Reporting on this Outcome Measure

Outcome #15

1. **Outcome Measures**

   Number of participants who increased knowledge through leadership development programs

2. **Associated Institution Types**

   - 1862 Extension
   - 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	5889

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many social and economic problems face Arkansas communities, especially in rural areas. To help resolve these problems, citizens must show initiative, responsibility, and decision-making skills. Some of Arkansas' leaders have never traveled beyond their local, state or national boundary. A leader who has a vision with both a close focus and a wide-angle perspective is in more touch with the changing world. Knowledgeable and dedicated leaders are needed at all levels of Arkansas communities.

What has been done
Through LeadAR, ConnectAR, and other adult and youth leadership program efforts at both the state and local levels, Extension is addressing this leadership development need. The training focuses on basic, practical skill development in communications, interpersonal relations, and networking as well as increasing participants' understanding of economics, policy formation, government, and social and cultural issues. Issues are approached from local, state, national, and international perspectives.

Results
Well over 5000 individuals have benefited from our state and local leadership programs in the past year. We maintain contact with more than 400 LeadAR alumni, and continue to document their service to the people of the state. Eighteen are currently serving in elected positions ranging from local quorum courts and city councils to the state legislature. Other graduates have acted in vital leadership roles by serving in non-profit organizations, public and private education, the justice system, and other units of state government. We have examples of leadership in engineering and infrastructure projects, environmental concerns, community disaster recovery, public parks, local economic development, recycling and sustainability projects, and public health and local leadership programs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
608	Community Resource Planning and Development
610	Domestic Policy Analysis
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and

	Communities
805	Community Institutions, Health, and Social Services
806	Youth Development

Outcome #16

1. Outcome Measures

Estimated dollar value of EH volunteers(approx. 350,000 hours donated)

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	8774000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Improving the economic well-being and quality of life for Arkansas citizens is increasingly challenging. Issues such as changing information technology and demographics and changing social needs all impact our society. While organizations and government play an important role in communities, it's the people who make a difference. Extension Homemakers helps equip and empower people to get involved and make a difference. These volunteers represent a critical catalyst in the creation and sustainability of vibrant and resilient communities.

What has been done
The Arkansas Extension Homemakers Council is one of the largest nonprofit volunteer groups in the state with a membership of 6,000 and clubs in every county. Extension Homemakers, the Cooperative Extension Service, University of Arkansas, and the United States Department of Agriculture are partners in providing continuing education and leadership development opportunities for Arkansas Extension Homemakers.

Results
A key tenet of the Extension Homemakers leadership development program is the importance of volunteerism to the quality of life in Arkansas communities. Collectively, Arkansas Extension Homemakers contributed 348694 volunteer hours in 2011 in direct support of Extension programs; indirect service through community projects; service learning to support the delivery of programs; and support through boards, committees, commissions, and advisory councils. Based on hourly rates taken from http://independentsector.org/volunteer_time) the result is an economic impact of over $8.7 million to Arkansas and our communities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development
610	Domestic Policy Analysis
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services
806	Youth Development

Outcome #17

1. Outcome Measures

Number of county emergency response teams that used Extension information and personnel for preparedness and post disaster response

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	17

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Tornadoes and flooding were serious issues in Arkansas in 2011, particularly in the spring and early summer. Rainfall totals through June exceeded 600 percent of normal in some areas, causing local flash flooding and long-term flooding in the Mississippi, White, and Arkansas river valleys. Tornadoes in six counties resulted in significant damage to property. Service and power disruptions were also common. Response required a significant resource commitment from government at all levels.

What has been done
Extension resources (the EDEN network, eXtension, and disaster preparedness and response materials) were important tools to assist counties in their recovery efforts. Extension coordinated preparedness and response with county judges, emergency management coordinators, and state and federal agencies including the National Guard, USDA, NRCS, FSA, and local groups. CES

Communications released more than 50 articles about extreme weather and and its effects. 34 county agents and faculty were trained in the basics of disaster management.

Results
Fifteen county Extension offices distributed information on both flood recovery and crop management and recovery. Educational materials were placed in locations through all disaster-affected counties, such as post offices, municipal buildings, churches, shelters, offices of emergency management, and police and fire departments, and community service organizations. Six county Extension offices directly assisted in relief and clean up efforts after tornadoes and flooding. Extension's USDA NIFA provided a $60,000 grant to support Extension's involvement in disaster response in Arkansas.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices
608	Community Resource Planning and Development
610	Domestic Policy Analysis
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services
806	Youth Development

Outcome #18

1. Outcome Measures

Number of individuals who gained Continuing Professional Education credits from participation in Extension's Income Tax School program

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	463

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Tax policy continues to change and those changes require accounting and business management professionals to remain updated in order to properly support individual and business tax planning and preparation. The UA Division of Agriculture Cooperative Extension Service Tax School program is accomplished as part of a consortium of universities led by the University of Illinois.

What has been done

Extension's income tax school program continues as an annual component of Extension's Community and Economic Development outreach. Materials provided include a textbook, electronic tax documents on DVD, and a tip sheet with updated state tax guidelines. The two-day workshops, which are held in ten cities throughout Arkansas, address tax issues from both the state and national perspective. Components include changes in tax code and case law, estate tax, agriculture, retirement, AMT, depreciation, and ethics.

Results

463 individuals completed the the Income Tax School program in 2011. The program continues to be in high demand among income tax and business professionals in our state. Participants earn sixteen hours of credit for continuing professional education as set forth in the Rules and Regulations of the Arkansas State Board of Public Accountancy. Evaluations consistently indicate that participants value the quality of instruction provided and the depth of information presented in a short time. They see the program as a good investment of time and money.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development
610	Domestic Policy Analysis
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
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 (Please see below for description of external factors)

Brief Explanation

The changing economy of the state and nation have placed a strain on available resources at all levels. High levels of enemployment are a continuing problem and lending capacity has been generally reduced.

Natural disasters, changing populations and demographics in local communities, and the demand for CED program response continues to increase.

Flooding and tornadoes in the spring of 2011 caused our organization's resources to be redirected somewhat. Population shifts in rural and delta communities

Economic circumstances for county government continue to strain the partnership with Extension.

New ethnicities - Hispanic, Hmong, and Marshallese - increase the need for multilingual educational products and services in Arkansas.

New regulations and unfunded federal mandates increase the financial and management demands on farmers, business owners, and state and local agencies.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

We systematically evaluate all training programs using a combination of Likert scale and respondant's descriptions. The evaluations are language-specific when needed. We use formal, distributed paper documents when appropriate, and supplement these with electronic survey tools including online surveys. When possible, we use Turning Point hardware and programs to immediately evaluate audience response at presentations. We use both pre-and post-test surveys with many of our programs. We maintain electronic lists of participants specific to each program so as to follow up, asking questions relative to changes in knowledge, behavior, and conditions.

The results of our evaluations are typically positive regarding content and presentation. They give us a perspective on our own perceptions of need compared to those of the participants in our programs. We use these results to improve our program content and presentation.

Key Items of Evaluation

Participation in the Hispanic Entrepreneurship project has been documented and evaluated. Using pre- and post- test evaluations, we learned that participants gained knowledge in how to start and operate businesses. Followup surveys have indicated that six months after these workshops, existing businesses have changed positively as a result of workshop partciipation. For example, twenty percent of previous business owners have written and implemented business plans where none were in place before.

Leadership development programs are systematically evaluated on a seminar-by-seminar basis and followed by an overall program content evaluation and goal accomplishment survey. The products of individual goals are evaluated for their economic value to the community in relationship to the financial investment required. Anecdotal success stories are complied for goals and accomplishments on a class by class basis.

Professional training seminars (Tax School, Water Policy and Law Conference) are evaluated annually. They must meet standards for content and and participant knowledge gained so as to qualify to offer continuing education credits through professional organizations.

V(A). Planned Program (Summary)

Program # 3

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
702	Requirements and Function of Nutrients and Other Food Components	20%		0%	
703	Nutrition Education and Behavior	35%		0%	
704	Nutrition and Hunger in the Population	0%		100%	
724	Healthy Lifestyle	35%		0%	
806	Youth Development	10%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	86.8	0.0	22.9	0.0
Actual Paid Professional	19.3	0.0	1.5	0.0
Actual Volunteer	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**
279149	0	0	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
327647	0	0	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2364701	0	205628	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The activities that are related to Food Safety and food processing have been moved to the U of A Food Safety program report:

Division of Agriculture faculty will develop, evaluate, and disseminate education programs and curricula, incorporating new research and emphasizing healthy lifestyles. Programs will include information on, but not limited to, foods and nutrition, cooking skills, exercise and physical activity, successful aging and wise medication use. Examples of programs:

Walk Across Arkansas (Adults)
Strong Women
Be Medwise Arkansas
Fit in 10
Living Well with Diabetes
Right Bite Cooking School
Mediterranean Cooking School
Aging in Place
AgrAbility

2. Brief description of the target audience

Youth, adults and senior adults
Child Care Providers
Health Professionals
Worksite Employees
Farmers
Consumers

3. How was eXtension used?

- Extension agents utilize information/lessons from the eXtension site.
- Staff members serve on CoP
- During professional development training there was a recurring session on eXtension

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	74753	233203	7015	1609

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

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	1	10	11

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Actual
2011	351

Output #2

Output Measure

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

Year	Actual
2011	10233

Output #3

Output Measure

- # of funded commodity board grants
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- # of funded Federal grants and contracts

Year	Actual
2011	2

Output #5

Output Measure

- # of funded non-federal grants/contracts funded

Year	Actual
2011	1

Output #6

Output Measure

- $ received through commodity board grants/contracts
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- $ received through funded Federal grants and contracts

Year	Actual
2011	185000

Output #8

Output Measure

- $ received through non-federal grants/contracts funded (industry, state)

Year	Actual
2011	4000

Output #9

Output Measure

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

Year	Actual
2011	74753

Output #10

Output Measure

- # of Food, Nutrition, and Health adult educational events

Year	Actual
2011	6868

Output #11

Output Measure

- # of adults enrolled in physical activity programs

Year	Actual
2011	4374

Output #12

Output Measure

- # of Nutrition labels developed
  Not reporting on this Output for this Annual Report

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 individuals who increased physical activities as a result of completing an Extension program
3	# of Peer reviewed publications
4	# of books or book chapters published in Food Science or Nutrition
5	# of national or international conferences where research in food, nutrition and health was disseminated
6	# of participants who adopted at least one positive nutrition practice.
7	# of participants reporting a reduction of at least one risk factor for chronic disease after completing a nutrition education program
8	# of new food businesses started
9	# of 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.

Outcome #1

1. Outcome Measures

# 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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4144

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	5207

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Physical activity is important for adults of all ages, but it is particularly important for older adults. Despite evidence on the positive health effects of regular physical activity, older adults are the least active group of Americans. According to Warburton, Nicol and Bredin (2006), the greatest improvements in health status are seen when people who are least fit become physically active. For the frail elderly, exercise programs that build muscle are particularly important to improving overall health status (Warburton, Gledhill, Quinney, 2001).

What has been done
One approach implemented to increase strength training among older adults in Arkansas is the StrongWomen Program, conducted by the University of Arkansas Cooperative Extension Service. StrongWomen is an evidence-based strength training program for mid-life and older women and is conducted in communities across the state.
New strategies are needed to increase access to strength training programs for older adults. The current need for strength-training programs is greater than public health?s capacity to address. As the older adult population continues to grow in number, the gap between need and availability of programs will likely continue to widen. One approach implemented to bridge this gap is the use of lay leaders in delivery of strength training programs, which expands access and offers an alternative to professionally-led classes. The StrongWomen Volunteer Lay Leader approach has been implemented in Arkansas. What differs in our implementation is that these lay-leaders are volunteers.

Results
213 Strong Women Volunteer Lay Leaders taught nearly 4,500 volunteer hours. These Volunteer along with the county extension agents reached over 5,207 non-duplicated contacts. These individuals met twice a week for one hour for a minimum of 12 weeks, many for the entire year resulting in duplicated contacts of 40,748. Of these participants, 62% increased lower body strength, 77% increased upper body strength, 66% increased aerobic endurance, 64% increased lower body flexibility, 72% increased upper body flexibility, and 73% increased agility/dynamic balance.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

# of Peer reviewed publications

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	11

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

Outcome #4

1. Outcome Measures

# of books or book chapters published in Food Science or Nutrition

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

Outcome #5

1. Outcome Measures

# of national or international conferences where research in food, nutrition and health was disseminated

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #6

1. Outcome Measures

# of participants who adopted at least one positive nutrition practice.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	9649

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Today's Arkansans have different cooking and eating practices compared with previous generations. Many adults who do cook still follow the typical southern practices of frying and seasoning with fat, sodium and sugar. Among the younger generations, the combination of insufficient vegetable and fruit consumption, increased frequency of away-from-home meals, poor food preparation skills, and increased portion size have all contributed to the rise in obesity and related chronic diseases. Lack of cooking skills interferes with one?s ability to prepare nutritionally sound food. When people know how to cook they are able to make tasty and healthful meal at home.

What has been done
UA Division of Agriculture conducted multi-session cooking programs to bring folks back to the kitchen. Arkansans with diabetes, heart disease and hypertension learned to cut fat, saturated fat, sugar and sodium in the foods they prepare. They learned to use healthier oils, season with herbs and spices and incorporate more fruits, vegetables and whole grains into their diets. Other Arkansans learned about the health benefits of the Mediterranean Diet and to prepare traditional foods of the eastern and western Mediterranean counties. The Mediterranean diet has been

linked with a decreased risk for chronic diseases and a longer life.

Results
297 Arkansans increased cooking skills through hands-on cooking experiences
87% said they intended to adopt one or more of the healthy food/nutrition practices learned
94% said they had already made one or more changes by the end of the class
91% increased fruit and or vegetable consumption
88% increased whole grain consumption
85% increased consumption of low fat or fat free dairy foods/beverages
94% decreased sodium consumption
96% decreased saturated and/or trans fat consumption

This class has been so helpful to me. Not only have I learned to cook for myself and control my diabetes, I have friends and family coming so they can learn to cook healthy for their families as well. As an added benefit, my A1c has dropped and my cholesterol is under control. Who knew I could lose 45 pounds cooking like I should and still eat great tasting foods. Miller Co. Right Bite participant

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #7

1. Outcome Measures

# of participants reporting a reduction of at least one risk factor for chronic disease after completing a nutrition education program

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	925

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #8

1. Outcome Measures

# of new food businesses started

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

# of 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

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	216

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Senior adults are typically described as individuals 65 years of age or older. Senior adults do experience age-related changes as well as medical issues that tend to increase as they age. Some of these changes interfere with daily living. In addition, people with disabilities face many barriers to good health. Anyone no matter their age can have a disability. There are many types of disabilities, such as those that affect a person?s hearing, vision, movement, learning,

communicating, or social relationships. Disabilities can affect different people in different ways. Studies show that people with disabilities are more likely than people without disabilities to report poorer overall health, less access to adequate health care, smoking, and very little physical inactivity.

What has been done

Making use of Universal Design (UD) principles can help all individuals, especially senior adults and people with disabilities, age in place successfully. The University of Arkansas Division of Agriculture is educating individuals on universal design, assistive technology, and housing options through the Aging in Place Program. This program targets older adults, disabled adults, and caregivers providing education on independent living.

Results

Forty-five people indicated that they would not have to move from their present residence and enter a nursing home based on the information that they learned from the Aging in Place program. With the average yearly cost of a nursing home being $37,572 and the individuals targeted for this program receive Medicaid and Disability, our program saved the government approximately $1,690,740 in nursing home expenses this past year.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)
- Other (Items related to Food Safety have been more to University of Arkansas Food Safety Planned Program and w be reported there. Some of the items that relate to nutrition that were reported here in the past are now being report in obesity.)

Brief Explanation

Although the impact on the people we reached was significant, numbers in many areas are not as high as anticipated. This is due to various external factors, which will be discussed in this statement.

The extensive flooding which plagued our state early last year, followed by a devastating drought hampered our efforts, and dealing with these natural disasters took precedence over some of the programs that we would have like to implement and promote. Additionally, the high unemployment rate in our state, particularly in the Delta region, and the resulting poor state of the general economic climate in our area negatively affected the ability of many individuals to take part in the programs that we offered.

While some programs were more successful in reaching people in one area, in another area, the same program may not have enjoyed the same level of success, due to competing public priorities in various counties, which resulted in competitive program

challenges.

Many of the items related to nutrition, education, and behavior are now being reporting in Obesity. All Items related to Food Safety have been moved to the University of Arkansas Division of Agriculture Food Safety Planned Program and will be reported there.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Each type of program has specific evaluation protocol. For example, the exercise programs have an actual physical evaluation based on the "Senior Fitness Test" by Human Kinetics whereas the nutrition education programs use both paper pre-post test evaluations as well as an audience response system by Turing Point. Web-based and mail surveys were also conducted on select programs.

Key Items of Evaluation

StrongWomen program--40,840 participants
• 65% improved upper body strength
• 65% improved lower body strength
• 60% improved balance
• 59% improved upper body flexibility
• 58% increased aerobic endurance.

Arthritis Foundation Life Improvement series--1,810 participants
• 91% reported joint benefit

Aging in Place--559 participants
• 45 (12%) of high-risk community dwelling senior adult participants did not need to move into skilled nursing facilities after information gained from program

Fit in 10--347 mail and electronic surveys sent with 27% response rate for the home-based users of the program
• 84% increased the number of days they exercised
• 81% increased the amount of time they spent exercising
• 38% used the DVD at least one time per week
• 59% increased balance
• 45% increased endurance
• 43% increased strength
• 50% increased flexibility

Be MedWise--792 participants
• 98% report they intend to start reading drug facts labels
• 96% report being more comfortable talking to their doctor
• 100% report they intend to be more proactive by asking questions with pharmacists/doctors before they combine drugs
• 71% report they intend to do better about telling their health care providers about any dietary supplements or herb they are taking before they take medications

V(A). Planned Program (Summary)

Program # 4

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	10%		10%	
112	Watershed Protection and Management	15%		15%	
122	Management and Control of Forest and Range Fires	5%		0%	
123	Management and Sustainability of Forest Resources	15%		15%	
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%	
136	Conservation of Biological Diversity	5%		5%	
403	Waste Disposal, Recycling, and Reuse	5%		5%	
605	Natural Resource and Environmental Economics	5%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	17.7	0.0	24.4	0.0
Actual Paid Professional	11.4	0.0	15.5	0.0
Actual Volunteer	2.3	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**
146198	0	37590	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
171597	0	909775	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1238455	0	605391	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Educational materials were developed utilizing available research, legal, and policy information. Were appropriate applied research was performed to supply information for educational material development. To facilitate and guide educational material development and distribution collaborative partnerships were establish and/or maintained. Once the educational material was developed they were disseminated via a variety of venues/mechanisms that included Educational Meetings. Workshops, Field Days, Demonstrations, Site Visits, and One-on-one consultations, News articles, Newsletters. These activities took place in face-to-face, phone conversation, traditional mass media releases, and various web base delivery systems.

2. Brief description of the target audience

4-H Club Youth
Agri Business Personnel
Row Crop Agricultural Producer Organizations
Row Crop Agricultural Producers
Certified Crop Advisors
Conservation District Directors
Consultants
Forest Landowner Groups
Forest Industry personnel
Loggers
Natural Resource Professionals
Landowners
Homeowners
Educators
State & Federal Agency personnel
Watershed Organizations
Wildlife Organizations
Private nutrient applicators
Commercial nutrient applicators
Livestock and Poultry producers
Livestock and Poultry industry personnel
Livestock and Poultry producer organizations

General public
Researchers
Policy makers
Youth
Teaching faculty
Research funding personnel and agencies

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	23243	189378	4199	73

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

Patent Applications Submitted

Year: 2011
Actual: 4

Patents listed

1. Kim, J.-W., Deaton, R. & Zharov, V.P. Near-infrared responsive carbon nanostructures. US patent application No US 12/664,630.

2. Kim, J.-W., Deaton, R. & Kim, J.-H. DNA-linked nanoparticle building blocks for nanostructure assembly and methods of producing the same. US provisional patent No 61/564,959.

3. Tung, S. & Kim, J.-W. AFM nanochannel DNA sequencing. UAF No 12-04.

4. Li, Y., and X. Su. 2011. Method for Detecting an Unknown Contaminant Concentration in a Substance. US Patent No. 7,939,343 B2, May 10, 2011.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	21	41	62

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of programs held for professional natural resource managers

Year	Actual
2011	10

Output #2

Output Measure

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

Year	Actual
2011	142

Output #3

Output Measure

- Number of Natural Resource Field Demonstrations

Year	Actual
2011	77

Output #4

Output Measure

- Number of Natural Resource Field Days

Year	Actual
2011	12

Output #5

Output Measure

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

Year	Actual
2011	11716

Output #6

Output Measure

- Number of Acres impacted as self-reported

Year	Actual
2011	3403850

Output #7

Output Measure

- Number of Educational Materials & Currica developed (fact sheets, presentations, handouts)

Year	Actual
2011	118

Output #8

Output Measure

- Number of Natural Resource Newsletters developed

Year	Actual
2011	6

Output #9

Output Measure

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

Year	Actual
2011	5

Output #10

Output Measure

- Number of Educational Materials & Currica delivered

Year	Actual
2011	118

Output #11

Output Measure

- Number of Natural Resource Newsletters delivered

Year	Actual
2011	14781

Output #12

Output Measure

- Number of individuals attending manure management related presentations addressing environmental issues

Year	Actual
2011	1588

Output #13

Output Measure

- Number of individuals engaged in manure management related consultations addressing environmental issues.

Year	Actual
2011	195

Output #14

Output Measure

- Number of hits at manure management Web page addressing environmental issues.

Year	Actual
2011	35113

Output #15

Output Measure

- Number of educational meetings related to air quality/emissions.

Year	Actual
2011	2

Output #16

Output Measure

- Number of non-food product related alternative agricultural systems education classes, workshops, group discussions, and other educational events

Year	Actual
2011	71

Output #17

Output Measure

- Number of alternative agricultural systems demonstrations (e.g., demonstration study farm, plots, etc.) not related to food products

Year	Actual
2011	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants indicating an increased knowledge of forestry and wildlife management
2	number of participants who adopt forestry and wildlife managment practices
3	Number of participants indicating an increased knowledge of air quality/emissions
4	Number of participants indicating an increased knowledge of water quality/quantity
5	Number of participants who adopt water quality/quantity practices
6	Number of participants indicating an increased knowledge of bioenergy production and energy conservation
7	Number of participants who adopt bioenergy production and energy conservation practices
8	Number of registered foresters maintaining certification
9	Number of nutrient management planners and applicators maintaining state certification
10	Number of livestock production clientele who gained knowledge related to manure management issues.
11	Number of clientele who implemented improvements in their manure management practices.
12	Number of participants indicating an increased knowledge of air quality/emissions.
13	Number of clientele who reported knowledge gained about non-food alternative agricultural products
14	Value of non-food alternative agricultural products (in $1000)
15	Number of acres utilized for non-food alternative agricultural products
16	Number of clientele who initiated an alternative agricultural enterprise with non-food products
17	Number of farms selling non-food alternative agricultural products or services using various methods

18	Number of clientele who used program information to decide NOT to initiate an alternative agricultural enterprise with non-food products
19	Number of participants who indicated intention to adopt recommended forestry and wildlife management practices
20	Number of clientele indicating intention to initiate an alternative agricultural enterprise with non-food products
21	Number of participants who indicate intention to adopt bioenergy production and energy conservation practices

Outcome #1

1. Outcome Measures

Number of participants indicating an increased knowledge of forestry and wildlife management

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4414

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. One of many challenges is the management of feral hogs to mitigate adverse impacts on the forest environment and adjacent agricultural and recreational lands. 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 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 around the state, support workshops, seminars, and field days.

Results
Data collected from a Feral Hog in-service training suggest that before the training, only 9 percent knew about capture methods for feral hogs, and afterwards, 67 percent of the 80 participants reported knowing all about capturing feral hogs. All attendees at a Women Woodland Owners Workshop indicated an increase in knowledge.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
136	Conservation of Biological Diversity
605	Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

number of participants who adopt forestry and wildlife managment practices

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Number of participants indicating an increased knowledge of air quality/emissions

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	50

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Air quality impacts from animal feeding operations are an emerging concern. Potential regulations and mitigating technologies could have adverse impacts on the economic viability of animal agriculture and consumer prices. Arkansas with a strong and viable poultry industry has a need to develop appropriate mitigating technologies and at the appropriate time provide the necessary dissemination educational information. Ammonia and particulate matter are the two pollutants of concern emitted from poultry houses. Mitigation of ammonia emission from broiler houses would be important for future viability of broiler operations and for protecting the environment and community health.

What has been done
In addition to demonstration of currently recommended vegetative shelter belts and wind break walls to limit off site movement of dust, research is underway to develop a practical cost effective biofilter system suitable for current poultry house ventilation systems. The spent organic media of this proposed mitigation system is expected to be non-hazardous and will have minimal impact on water and air quality when utilized as a soil amendment/nutrient source via land application to crop and pasture land.

Results
While this is a fairly new programing effort the research is in progress and educational efforts have been limited. However air quality and air emissions topics are incorporated into existing environmental and production related educational presentations and materials. As a result of these imbedded efforts, 50 individuals indicated that they have increased their knowledge in the air quality and air emissions area.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation

Outcome #4

1. Outcome Measures

Number of participants indicating an increased knowledge of water quality/quantity

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of participants who adopt water quality/quantity practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2132

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 Best Management Practices (BMPs) in reducing sediment and nutrients in runoff from pasture/hayland and rowcrop based agricultural operations. To provide a focus for these efforts and enhance partnerships with various agencies, industry groups, and producers the Arkansas Discovery Farm Program was initiated with 5 commercial farms across the state representing both livestock and row crop production. Water quality monitoring coupled with farm records will provide needed farm

scale information of the impact of farming on water quality and benefits of implementing mitigating BMPS. In addition to these on farm activities, research has taken place utilizing both modeling and in stream sampling approaches for planning and assessment purposes.

Results
1588 individuals attended presentations related to potential environmental impacts of manure management. 195 individuals were engaged in consultations on this subject. There were also over 35,000 hits on the manure management and nutrient management web pages. Not included in the numbers above are 5 three-day professional in-service training meetings for nutrient management planners. They used this training to revise 197 plans that detailed the management of almost 15,000 acres. Research assessing flow-weighted, in-stream nutrient concentrations have shown that improvements in municipal wastewater treatment facilities have resulted in dramatic decreases in phosphorus, and that evidence suggests that implementation of agricultural best management practices has improved water quality and that phosphorus, as well as nitrogen and sediment, are decreasing in many of our regional streams because of the efforts of the watershed stakeholders.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
136	Conservation of Biological Diversity

Outcome #6

1. Outcome Measures

Number of participants indicating an increased knowledge of bioenergy production and energy conservation

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	76

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 feed stocks Arkansas growers are seeking answers. There has been an increase in the interest in energy conservation on the part of farmers and home owners.

What has been done
Research has been conducted related to cropping systems for high oil soybeans, Canada grass, switchgrass, sweet sorghum, hybrid poplar, and elephant grass (miscanthus). Similar research is taking place related to forest biomass production. Ongoing research also pertains to thermochemical conversion (primarily gasification) into energy of these as well as other feedstock such as manure, algae, and wood products. In addition, broiler farm energy audits have been performed as a research/service/educational effort. An energy newsletter is also being published targeting home energy conservation issues.

Results
30 broiler farm energy audits were performed and recommendations made. The sharing of the audit results with the farm managers increased their knowledge of the shortcomings and opportunities of their farms. 15 editions of the Energy E-tips newsletter were written for homeowners. As a result of these efforts 76 individuals indicated that they have increased their knowledge.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse
605	Natural Resource and Environmental Economics

Outcome #7

1. Outcome Measures

Number of participants who adopt bioenergy production and energy conservation practices

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Number of registered foresters maintaining certification

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	400

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 419 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 University of Arkansas Division of Agriculture's 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 2011, three different courses sponsored by the Forestry Continuing Education program in cooperation with the State Board of Registration for Foresters attracted 400 registered foresters. All attendees received continuing education credit hours toward maintaining their certification.

4. Associated Knowledge Areas

KA Code	Knowledge Area

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
136	Conservation of Biological Diversity
605	Natural Resource and Environmental Economics

Outcome #9

1. Outcome Measures

Number of nutrient management planners and applicators maintaining state certification

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	155

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
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 has an extensive history of providing manure and nutrient management education to both landowners and technical service providers. A portion of the range of education material is nutrient applicator training targeting private and

commercial applicators and a three day in-service training required to be a state certified nutrient management planner. Five three-day professional in-service training meetings for nutrient management planners were held.

Results
As a result over 85 professionals received certification training and nutrient management plans were revised for over 197 client farms that detailed the management of over 14,500 acres. There were also 7 nutrient applicator meetings held to provide training for 70 private and commercial nutrient applicators.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse
605	Natural Resource and Environmental Economics

Outcome #10

1. Outcome Measures

Number of livestock production clientele who gained knowledge related to manure management issues.

Not Reporting on this Outcome Measure

Outcome #11

1. Outcome Measures

Number of clientele who implemented improvements in their manure management practices.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual

2011 197

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
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 has an extensive history of providing manure and nutrient management education to both landowners and technical service providers. A portion of the range of education material is nutrient applicator training targeting private and commercial applicators and a three day in-service training required to be a state certified nutrient management planner. Five three-day professional in-service training meetings for nutrient management planners were held.

Results
As a result over 85 professionals were trained and nutrient management plans were revised for over 197 client farms that detailed the management of over 14,500 acres. There were also 7 nutrient applicator meetings held to provide training for 70 private and commercial nutrient applicators.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
403	Waste Disposal, Recycling, and Reuse

Outcome #12

1. Outcome Measures

Number of participants indicating an increased knowledge of air quality/emissions.

Not Reporting on this Outcome Measure

Outcome #13

1. Outcome Measures

Number of clientele who reported knowledge gained about non-food alternative agricultural products

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1370

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

Outcome #14

1. Outcome Measures

Value of non-food alternative agricultural products (in $1000)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	178

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue (Who cares and Why)
Many agricultural producers and private landowners seek ways to generate income from their land. Producers are diversifying their operations and marketing strategies to increase profitability and sustain farms. There is a trend of increasing sales directed to the public and substantial emergence of the organic and farmer markets.

What has been done
Through workshops, one-on-one consultation, demonstrations, and meetings, clientele were educated about different income generating opportunities.

Results
Participants were asked to indicate how much money they thought they might potentially earn or save as a result of the knowledge gained during the presentations, workshops, or other educational activity. On average, respondents attending a wildlife enterprise workshop believed that they would earn approximately $14,300 in additional income by implementing conservation regimes and enterprise development on their properties based on information gained at the workshop. A total of over $100,000 was either saved or earned as self-reported.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

Outcome #15

1. Outcome Measures

Number of acres utilized for non-food alternative agricultural products

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	461

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Current trends indicate declining numbers of full-time farmers but an increase in part-time and alternative farmers. These part-time and alternative agricultural producers continually seek new and innovative ways to generate farm income. Identifying niche markets and capitalizing on specialized agricultural opportunities is a matter of economic sustainability and cultural survival for many agricultural producers.

What has been done
Producers were encouraged to make management decisions concerning their production strategies during workshops and meetings. Many farms, especially in the Delta region of the state, have incorporated wildlife recreation and hunting as alternative enterprises to their rice production.

Results
Most of these enterprises are relatively small. In FY 2011, clientele who completed the Wildlife Enterprise program reported that they managed 461 acres in alternative agricultural enterprise.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

Outcome #16

1. Outcome Measures

Number of clientele who initiated an alternative agricultural enterprise with non-food products

Not Reporting on this Outcome Measure

Outcome #17

1. Outcome Measures

Number of farms selling non-food alternative agricultural products or services using various methods

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	223

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

Outcome #18

1. Outcome Measures

Number of clientele who used program information to decide NOT to initiate an alternative agricultural enterprise with non-food products

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	14

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Research suggests that only 1% to 5% of individuals who attend workshops about establishing alternative enterprises actually initiate one. The decision to not pursue an alternative agricultural enterprise is therefore as meaningful as the decision to establish one.

What has been done
Participants in the Wildlife Enterprise program were asked to indicate whether or not they would establish an alternative enterprise as a result of attending workshops, conferences, or meetings.

Results
According to evaluations results, 14 participants decided not to pursue an alternative agricultural enterprise as a result of attending a wildlife enterprise workshop.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

Outcome #19

1. Outcome Measures

Number of participants who indicated intention to adopt recommended forestry and wildlife management practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	196

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Forest and wildlife management plan decisions are long term decisions. Most forest management plans cover a 30 year time period. Therefore planning decisions should be considered carefully. However, nationwide, only 2% of ALL forest landowners have management plans. Educating landowners about management plans is therefore very important for the future supply of forest resources benefits. Private landowners account for approximately 80% of the landholdings in Arkansas including forested and non-forested land. Those who adopt forest and wildlife management practices will not only realize wood products from their land but also provide other environmental services including wildlife habitat. Habitat management not only helps game species such as whitetail deer. It can also help species of concern such as northern bobwhite, spotted skunk, and 300+ lesser known species described in the state wildlife action plan. Sustainable forest management also improves forest ecosystem health, maintains water quality, and provides important aesthetic values.

What has been done
The University of Arkansas Division of Agriculture is conducting field research and education on forest and wildlife management practices that are sustainable and affordable for private forest landowners. Registered foresters and other natural resource professionals also receive annual training that enables them to advise landowners on the best practices for the individual landowner's property and management goals.

Results
In FY2011, 79 landowners indicated that they would develop a management plan as a result of attending various field days and workshops. Over 196 landowners stated that they would implement at least one new practice as a result of their new knowledge. Roughly 81 percent of respondents (21) attending a wildlife management workshop expected to change their land use practices on their properties based upon knowledge gained at the workshop.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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 #20

1. Outcome Measures

Number of clientele indicating intention to initiate an alternative agricultural enterprise with non-food products

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	40

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There is a trend of increasing sales directed to the public and substantial emergence of the organic and farmer markets. Almost fifteen hundred Arkansas farms provided direct sales to the public with total sales of $5.7 million according to the 2002 USDA Census of Agriculture. Growth in the organic market ranges from 15% to 20% annually since 1997. Total food sales for organic products have grown from 0.81% to 2.48% from 1997 to 2005. Other alternative agricultural segments are also experiencing growth.

What has been done
Clientele learned about the opportunities afforded by the addition of alternative agriculture enterprise to their practice.

Results
Results from a multi-state wildlife enterprise workshop indicated that about 53% of these landowners expect to lease properties for wildlife enterprises in the future. An additional 40 participants indicated that they would initiate an alternative agriculture enterprise as a result of our educational efforts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
131	Alternative Uses of Land

Outcome #21

1. Outcome Measures

Number of participants who indicate intention to adopt bioenergy production and energy conservation practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	29

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 feed stocks Arkansas growers are seeking answers. There also been an increase in the interest in energy conservation on the part of farmers and home owners.

What has been done
Research has been conducted related to cropping systems for high oil soybeans, Canada grass, switchgrass, sweet sorghum, hybrid poplar, and elephant grass (miscanthus). Similar research is taking place related to forest biomass production. Ongoing research also pertains to thermochemical conversion (primarily gasification) into energy of these as well as other feedstock such as manure, algae, and wood products. In addition, broiler farm energy audits are being performs as a research/service/educational effort. An energy newsletter is also being published targeting home energy conservation issues.

Results
The gasification research has resulted in an auger feed system gasifier capable of converting the wide range of Arkansas source energy crops, forest biomass, and animal manures into combustible gas. Potential application after scaling up to appropriate capacity include on farm systems to convert manures to gas for local use. Conceptually this would not only provide energy but also concentrate manure nutrients, especially phosphorus, to facilitate off farm movement and marketing. 30 broiler farm energy audits were performed and recommendations were made that if implemented will result in an estimated 22 Billion Btu energy savings. From collected surveys 29 individuals indicated that they were going to adopt bioenergy or energy conservation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
136	Conservation of Biological Diversity
403	Waste Disposal, Recycling, and Reuse
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.)

Brief Explanation

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

External factors such as natural disasters, economy, appropriations changes, public policy changes, government regulations, competing public priorities, competing programmatic challenges, and population changes can have an effect on program priorities and implementation. Severe floods, drought, and economic stress dramatically impacted program results in FY2011.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

When appropriate 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 gage 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 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 # 5

1. Name of the Planned Program

Global Food Security and Hunger- Plant 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	5%		8%	
102	Soil, Plant, Water, Nutrient Relationships	5%		10%	
111	Conservation and Efficient Use of Water	5%		6%	
112	Watershed Protection and Management	5%		6%	
201	Plant Genome, Genetics, and Genetic Mechanisms	5%		10%	
204	Plant Product Quality and Utility (Preharvest)	5%		10%	
205	Plant Management Systems	5%		16%	
211	Insects, Mites, and Other Arthropods Affecting Plants	5%		3%	
212	Pathogens and Nematodes Affecting Plants	5%		5%	
213	Weeds Affecting Plants	5%		10%	
216	Integrated Pest Management Systems	5%		3%	
601	Economics of Agricultural Production and Farm Management	5%		7%	
602	Business Management, Finance, and Taxation	5%		0%	
603	Market Economics	5%		2%	
604	Marketing and Distribution Practices	5%		0%	
606	International Trade and Development	5%		2%	
610	Domestic Policy Analysis	5%		1%	
611	Foreign Policy and Programs	5%		0%	
703	Nutrition Education and Behavior	5%		0%	
704	Nutrition and Hunger in the Population	5%		1%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Extension	Research

Year: 2011	1862	1890	1862	1890
Plan	30.6	0.0	2.2	0.0
Actual Paid Professional	87.0	0.0	182.5	0.0
Actual Volunteer	2.5	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**
1164183	0	1612586	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1366444	0	10983788	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
9861926	0	2907288	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

University of Arkansas Division of Agriculture faculty developed, evaluated, and disseminated needs-based programs that focused 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 were used to conduct one-on-one and group training with individuals who fell within the parameters of the program. A series of eight lessons were utilized by staff that focused on food budgeting, food safety, healthy lifestyles, healthy food consumption, meal planning, and nutritious food preparation.

Division of Agriculture faculty developed improved crop systems to help boost U.S. agricultural production and improve the global capacity to meet the growing food demand.

In this planned program area, Division Of Agriculture researchers and Extension educators provided unbiased research-based information and technical assistance on topics related to crop production systems for food-related crops. Information was disseminated focusing on the needs of consumers, the general public and row crop and fruit, vegetable andnut crop producers.

UA Division of Agriculture faculty worked together to understand related issues of food crop production and food crop products and processing. These activities also expanded our knowledge of the impact of food crop production on environmental and economic sustainability.

The goal of the Division of Agriculture research program was to provide pertinent basic and practical information on food crop production in order to help Arkansas food crop producers remain competitive in

the global market place.

2. Brief description of the target audience

The primary targeted audiences for this planned program consist of the following:

Supplemental Nutrition Assistance Program participants
Low income adults
Agricultural food crop producers, including those growing row crops, fruit crops, vegetable crops and nut crops
Agricultural businesses
Allied industry personnel
Consultants
Other non-Division of Agriculture researchers
Research funding personnel & agencies
Policy and decision makers
Public

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	177924	275477	19206	5401

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

Patent Applications Submitted

Year: 2011
Actual: 1

Patents listed
13/068,760 A-1710 Table Grape
APF-77 Blackberry US Plant Patent
System for determining N level from digital image US Utility Patent # 12/800,849

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	3	87	90

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

Output #2

Output Measure

- # of farm visits made related to pest management

Year	Actual
2011	94

Output #3

Output Measure

- # of pesticide applicator education classes

Year	Actual
2011	215

Output #4

Output Measure

- # of homeowner education classes related to pest management

Year	Actual
2011	14

Output #5

Output Measure

- # of research field days related to pest management

Year	Actual
2011	7

Output #6

Output Measure

- # of workshops related to pest management

Year	Actual
2011	14

Output #7

Output Measure

- # of newsletter articles related to pest management

Year	Actual
2011	870

Output #8

Output Measure

- # of Arkansas Commodity Board grants received

Year	Actual
2011	120

Output #9

Output Measure

- # of federal grants and contracts

Year	Actual
2011	31

Output #10

Output Measure

- # of educational classes related to pest management

Year	Actual
2011	215

Output #11

Output Measure

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

Year	Actual
2011	996

Output #12

Output Measure

- # of agronomic production education meetings related to food production

Year	Actual
2011	457

Output #13

Output Measure

- # of demonstrations/on-farm research related to food crop production

Year	Actual
2011	780

Output #14

Output Measure

- # of farm visits related to food crop production

Year	Actual
2011	12557

Output #15

Output Measure

- # of row crop field days related to food production

Year	Actual
2011	337

Output #16

Output Measure

- # of educational meetings, demonstrations, field days, site visits, and other group events held to educate commercial and consumer clientele in fruit, nut, and vegetable production

Year	Actual
2011	49

Output #17

Output Measure

- Dollars of Arkansas Commodity Board Grants received

Year	Actual
2011	6588065

Output #18

Output Measure

- Dollars of federal grants and contracts received

Year	Actual
2011	3369466

Output #19

Output Measure

- # of clientele contacts from educational classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational methods related to food crop production

Year	Actual
2011	197130

Output #20

Output Measure

- # of plant sites surveyed or monitored related to biosecurity

Year	Actual
2011	20

Output #21

Output Measure

- # of food production alternative agricultural systems related education classes, workshops, group discussions, and other educational events

Year	Actual
2011	6

Output #22

Output Measure

- # of food production alternative agricultural systems related demonstrations (e.g.,demonstration study farm, food plots, etc.)

Year	Actual
2011	36

Output #23

Output Measure

- # of grants written and funded in support of food and nutrition programming and research

Year	Actual
2011	24

Output #24

Output Measure

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

Year	Actual
2011	33361

Output #25

Output Measure

- # of food and nutrition education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational events

Year	Actual
2011	2281

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
17	Total production (bushels) of harvested wheat (all)

18	Total production of harvested soybeans (all)(1000 bushels)
19	Total production (cwt) of harvested rice (all)
20	Total production (bushels) of harvested corn in Arkansas
21	Total production (bushels) of sorghum harvested in Arkansas
22	# of samples submitted for plant testing related to food production
23	# of clientele (non-duplicated) who use the DD50 program for improved rice production
24	# of clientele using the RICESEED program
25	# of clientele that utilize SOYVA to assist with variety selection
26	# of diagnostic nematode samples submitted
27	# of Asian Soybean Rust positive samples
28	# of clientele who reported knowledge gained about alternative food products
29	Value of alternative agricultural food products sold ($1000)
30	# of clientele who initiated an alternative agricultural food-related enterprise
31	# of farms selling alternative agricultural food-related products or services by various methods, such as farmers markets
32	# of clientele who used program information to decide NOT to initiate an alternative food-related enterprise
33	# of participants who indicated that they increased their knowledge related to food, nutrition and/or food resource management following completion of a nutrition education program
34	# of participants who adopted at least one positive nutrition practice
35	# of participants who indicated that they intend to adopt one or more healthy food/nutrition/resource management practice
36	# of participants who adopted at least one food resource management practice
37	# of participants who reported saving money on groceries following completion of a nutrition education program

38	# of participants who reported they less often run out of food before the end of the month following completion of a nutrition education program
39	# of participants who increase knowledge of Agricultural Economics and Agribusiness
40	Sustainable, vibrant and globally competitive agricultural sector for Arkansas as indicated by Arkansas Cash Farm Receipts (in thousand dollars) (NASS)
41	Sustainable, vibrant and globally competitive agricultural sector for Arkansas as indicated by Arkansas Net Farm Incomes (in thousand dollars) (ERS)

Outcome #1

1. Outcome Measures

# 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

3b. Quantitative Outcome

Year	Actual
2011	6947

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #2

1. Outcome Measures

# of participants passing commercial pesticide certification exams

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1800

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

# of submissions to diagnostic clinic

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1013

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

Outcome #4

1. Outcome Measures

# of clients using scouting programs

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	5095

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

# of pest monitoring traps utilized

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	591

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants

216	Integrated Pest Management Systems

Outcome #6

1. Outcome Measures

Annual soybean yield - bushels per acre

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	42

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #7

1. Outcome Measures

Annual value of soybean production (1,000 Dollars)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1491120

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #8

1. Outcome Measures

Annual rice (all) yield -- pounds per acre

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual

2011	7067

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #9

1. Outcome Measures

Annual value of rice (all) production (1,000 dollars)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1054350

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

Outcome #10

1. **Outcome Measures**

Annual cotton (all) yield -- pounds per acre

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

% of soybean acreage receiving herbicide applications

Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

% of soybean acreage receiving insecticide applications

Not Reporting on this Outcome Measure

Outcome #14

1. **Outcome Measures**

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

Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

% of soybean acreage receiving fungicide applications

Not Reporting on this Outcome Measure

Outcome #16

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #17

1. Outcome Measures

Total production (bushels) of harvested wheat (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1999347000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #18

1. Outcome Measures

Total production of harvested soybeans (all)(1000 bushels)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3056032

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #19

1. Outcome Measures

Total production (cwt) of harvested rice (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	185009000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #20

1. Outcome Measures

Total production (bushels) of harvested corn in Arkansas

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	73840000

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, extension agronomist, 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 2011, 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 over 180 bu/acre. The state average corn yield was 142 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 2011 showed that irrigation is very important. With

proper irrigation and management, verification fields yielded 38 bu/acre more than state average fields. 38 bu/acre X $6.50/bu = $247/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

KA Code	Knowledge Area
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
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #21

1. Outcome Measures

Total production (bushels) of sorghum harvested in Arkansas

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	214443000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #22

1. Outcome Measures

# of samples submitted for plant testing related to food production

Not Reporting on this Outcome Measure

Outcome #23

1. Outcome Measures

# of clientele (non-duplicated) who use the DD50 program for improved rice production

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	602

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
201	Plant Genome, Genetics, and Genetic Mechanisms
205	Plant Management Systems

Outcome #24

1. Outcome Measures

# of clientele using the RICESEED program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	250

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
201	Plant Genome, Genetics, and Genetic Mechanisms
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems

Outcome #25

1. Outcome Measures

# of clientele that utilize SOYVA to assist with variety selection

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	250

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
201	Plant Genome, Genetics, and Genetic Mechanisms
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems

Outcome #26

1. Outcome Measures

# of diagnostic nematode samples submitted

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	31

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done
The State Nematode Diagnostic Laboratory was APHIS certified this year to accept out of state samples. Besides soil samples, the lab has increased samples for white tip nematode for rice export, and pinewood nematode in conifer to be used as bio-fuel in Europe.

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

Outcome #27

1. Outcome Measures

# of Asian Soybean Rust positive samples

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual

2011	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

Outcome #28

1. Outcome Measures

# of clientele who reported knowledge gained about alternative food products

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	59

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

601 Economics of Agricultural Production and Farm Management
604 Marketing and Distribution Practices

Outcome #29

1. Outcome Measures

Value of alternative agricultural food products sold ($1000)

Not Reporting on this Outcome Measure

Outcome #30

1. Outcome Measures

# of clientele who initiated an alternative agricultural food-related enterprise

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Currently, Arkansas pecan production is among the least efficient in the United States. This inefficiency can be attributed both to the lack of knowledge about production practices and the lack of recommended practices in the areas of pest management, orchard management, economics, and food safety.
To gather information about current practices in the state, a grower survey was conducted to give us a comprehensive picture of current practices- including management, nutrition, and processing, pest level data, and nutritional status of orchards. Educational activities were coordinated with the Arkansas Pecan Grower Association (APGA) to help us deliver information growers deem necessary to their farming operations. This information was delivered during one-on-one contacts and during the annual meeting of the association.

What has been done

Most growers throughout the state have routinely sprayed for Pecan Nut Casebearer (PNC). We were able to demonstrate this pest was not present in some locations. Famers have been able to reduce insecticide applications based on this information. PNC was trapped in an area where the growers were not aware of its presence. Based on this information, the growers applied insecticide thus avoiding the possibility of extensive economic damage.

Results
A pecan degree day accumulation model for PNC has been set up at the UACES webpage (http://pecan.uaex.edu/DD35SelectInsects.asp) to help grower determine when insecticide applications are needed for this pest.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

Outcome #31

1. Outcome Measures

# of farms selling alternative agricultural food-related products or services by various methods, such as farmers markets

Not Reporting on this Outcome Measure

Outcome #32

1. Outcome Measures

# of clientele who used program information to decide NOT to initiate an alternative food-related enterprise

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual

2011 6

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Estimating the costs of production and conducting what-if analyses around costs, revenues and production levels are important components for planning and for financial management of raspberry production. Although many raspberry producers develop their own budgets, some prefer to begin with existing budgets and adjust them according to
their specific situation. The budget developed in this project serve as a starting point for the latest group.

What has been done
An interactive tool was created to help producers in estimating the costs of production and in conducting sensitivity analyses around total costs and net returns associated with different production practices (including field and high tunnels) and different cultivars.
The practices described are based on production procedures considered typical for northwest Arkansas. Information was placed into an Excel spreadsheet to make the budget interactive.

Results
Producers select interest rate, inflation rate, planting density, expected prices, marketing plan and the production system (field or high tunnel production); then the budget is calculated automatically. Producers could estimate several budgets by using default cost values, by entering their own farm values or by combining both. The budgets calculate automatically total cost per year, breakeven analyses for yield and price and a sensitivity analyses for total cost and net returns. Allowing comparisons among different raspberry cultivars and production systems (field and high tunnels)would assist raspberry producers to make better planning and financial decisions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

Outcome #33

1. Outcome Measures

# of participants who indicated that they increased their knowledge related to food, nutrition and/or food resource management following completion of a nutrition education program

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2325

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

Outcome #34

1. Outcome Measures

# of participants who adopted at least one positive nutrition practice

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2146

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

Outcome #35

1. Outcome Measures

# of participants who indicated that they intend to adopt one or more healthy food/nutrition/resource management practice

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1873

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

Outcome #36

1. Outcome Measures

# of participants who adopted at least one food resource management practice

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1801

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

Outcome #37

1. Outcome Measures

# of participants who reported saving money on groceries following completion of a nutrition education program

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1426

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

Outcome #38

1. Outcome Measures

# of participants who reported they less often run out of food before the end of the month following completion of a nutrition education program

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1922

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

Outcome #39

1. Outcome Measures

# of participants who increase knowledge of Agricultural Economics and Agribusiness

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	30691

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices
606	International Trade and Development

610	Domestic Policy Analysis
611	Foreign Policy and Programs

Outcome #40

1. Outcome Measures

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 Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	7688296

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices
606	International Trade and Development
610	Domestic Policy Analysis
611	Foreign Policy and Programs

Outcome #41

1. Outcome Measures

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 Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1340033

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics
604	Marketing and Distribution Practices
606	International Trade and Development
610	Domestic Policy Analysis
611	Foreign Policy and Programs

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

Brief Explanation

External factors that impacted outcomes included the following: 1) Program realignment impacted efforts expended in several of the listed planned programs within the Global Food Security and
Hunger -Plant Related 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 several segments of this program.

Global food production outcomes were influenced by market conditions, including rising energy costs, the fuel versus food pressure, changes in payments to farmers, increased production input costs, land grant
university funding, the continued downturn in both the national and world economy, and as always, weather conditions. All of these factors had some impact on the Global Food Security and Hunger - Plant Related planned program.

V(I). Planned Program (Evaluation Studies)

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. Twenty-one percent of the rice grown in Arkansas in 2011 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 6840 lbs/acre in 2011. Assigning a conservative value of 60 percent of this 2730 lbs/acre yield increase to new varieties, the average monetary gain in 2011 over 1980, at a rough rice price of $13.75/cwt, would be $375/acre or $434 million for the 1.155 million acres harvested in Arkansas in 2011, of which $91 million is due to the Arkansas varieties.

Yields in corn, soybean, wheat, and rice verifications fields that used UA Division of Agriculture recommendations were compared to state averages. For example, yields in the corn verification program averaged over 180 bu/acre whereas the state average corn yield was 142 bu/acre. The 38 bu increase in yields in the verification program were due to proper hybrid selection, planting rates, adequate fertility, weed control, and irrigation. This could be shown as 38 bu/acre X $6.50/bu = $247/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.

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. Surveys conducted of meeting attendees indicate learning about IPM methods and incorporating methods learned at meetings into crop production practices. Proper pest management was important in increasing crop yields.

Key Items of Evaluation

Adoption of IPM methods

Agricultural producers trained

Program output results were summarized from data collected by Division educators and researcher and provided in program/project reports.

Evaluation data used to determine program outcomes was collected through participant surveys and post-meeting assessment questionaire.

V(A). Planned Program (Summary)

Program # 6

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%		10%	
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
111	Conservation and Efficient Use of Water	10%		10%	
112	Watershed Protection and Management	10%		10%	
201	Plant Genome, Genetics, and Genetic Mechanisms	10%		10%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	10%		10%	
204	Plant Product Quality and Utility (Preharvest)	10%		10%	
205	Plant Management Systems	10%		10%	
206	Basic Plant Biology	10%		10%	
213	Weeds Affecting Plants	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	17.4	0.0	8.9	0.0
Actual Paid Professional	43.9	0.0	13.3	0.0
Actual Volunteer	86.8	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**
643171	0	116274	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
754913	0	1030752	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
5448371	0	205058	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
▪ Conduct discovery and applied research
▪ Publish educational materials
▪ Provide diagnostic services
▪ 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
Extension Specialists
Teaching faculty
Research funding personnel and agencies
Public
Students

3. How was eXtension used?

Participate in consumer horticulture working group by answering horticulture questions from the public.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	97121	127181	4785	1321

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

Patent Applications Submitted

Year: 2011
Actual: 1

Patents listed
System for determining N level from digital image 12/800,849

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	1	19	20

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of agronomic production education meetings related to production of non-food crops

Year	Actual
2011	396

Output #2

Output Measure

- # of demonstrations/on-farm research related to production of non-food crops

Year	Actual
2011	258

Output #3

Output Measure

- # of farm visits related to production of non-food crops

Year	Actual
2011	3666

Output #4

Output Measure

- # of row crop field days related to production of non-food crops

Year	Actual
2011	79

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

Year	Actual
2011	3472

Output #6

Output Measure

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

Year	Actual
2011	64

Output #7

Output Measure

- $ of Arkansas Commodity Board Grants received

Year	Actual
2011	268492

Output #8

Output Measure

- $ of federal grants and contracts

Year	Actual

2011	272044

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

Year	Actual
2011	229087

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 new Master Gardeners trained and certified
3	# of commercial forage producers who changed or adopted a new forage management practice
4	# of non commercial participants who changed or adopted a new forage and/or grazing management practice
5	# of Master Gardeners who recertified
6	# of new horticultural businesses and new farmers markets
7	# of samples submitted for soil testing related to non-food crop production
8	# of samples submitted for plant testing related to non-food crop production
9	Total production (bales) of harvested cotton (all)
10	Total production (tons) harvested of hay (all)
11	# of clientele who make plant management decisions based on COTMAN

Outcome #1

1. Outcome Measures

# 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

3b. Quantitative Outcome

Year	Actual
2011	839

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
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

# of new Master Gardeners trained and certified

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	474

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Master Gardener Program continues to grow in Arkansas, and many counties are seeking grant opportunities and trying to make their programs more cost efficient. Guidelines are needed to help them manage finances across the program.

What has been done
New financial guidelines were introduced across the state, via training with agents, Master Gardener volunteers and support staff.

Results
This effort will impact the state by strengthening our Master Gardener program and keep us current with IRS guidelines.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
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

# 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 Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	56

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
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

# 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 Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	44

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
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

# of Master Gardeners who recertified

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2308

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The interest in home gardening and producing your own food has grown exponentially in the country and childhood obesity has been gathering national interest. To get our youth eating better and knowing where their food supply comes from, we need to engage them at a young age.

What has been done
Arkansas was one of four states awarded a national USDA grant for the People?s Garden. 35 classrooms across the state will be putting in school gardens and creating curriculum to teach children about the importance of vegetables in their diet. We also conducted our first statewide youth gardening training for adults to take the information back to their county programs.

Results
This effort will impact the state by getting the youth involved in gardening both at school and hopefully at home. In addition it should increase the consumption of fresh vegetables into their diet.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water

112	Watershed Protection and Management
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
206	Basic Plant Biology
213	Weeds Affecting Plants

Outcome #6

1. Outcome Measures

# of new horticultural businesses and new farmers markets

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	17

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Collection of real-time inventory data is expensive, time consuming, and often imprecise. As a result, nurseries and Christmas tree growers frequently rely on estimates to determine current inventory.

What has been done
To be efficient with limited resources, a group of University collaborators and representatives from industry, have joined forces to develop an inventory system that will enable producers to collect and analyze images that will provide accurate (>90%) counts of a variety of open- grown plant material under field conditions. The team is also evaluating other remote sensors that can be carried by the aerial platform for use in crop monitoring and irrigation scheduling.

Results
Collaborative efforts are focused on development of an as-needed, automated system for inventory management and crop monitoring in open-field nurseries and Christmas tree farms. To better understand the problem, the team conducted a survey of 43 nursery growers from across the country in August 2011. Producers were split nearly equal between field and container

production. 100% of growers indicate the process to collect inventory data can be improved. 29% of respondents indicate they lose at least 10% of their gross sales to poorly timed or inaccurate inventory data. Over one-half (55%) of field growers collect inventory at least twice per year on an average of 716,000 plants. Based on the survey, an average nursery would spend $61,000 or 2.8% of gross sales to collect inventory data.
The research team is continuing their research efforts with a goal of developing a low-cost aerial-based remote sensing system to provide timely and accurate inventory data to growers by 2014.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

Outcome #7

1. Outcome Measures

# of samples submitted for soil testing related to non-food crop production

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

# of samples submitted for plant testing related to non-food crop production

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Total production (bales) of harvested cotton (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1300000

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 2011 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 production season. Will the use of precision agriculture technologies more specifically variable rate planters help producers acquire better stands while at the same time reducing input costs for seed?

What has been done
In 2008 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 2011. 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 out of the 650,000 acres planted to cotton in 2011 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

KA Code	Knowledge Area
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

204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
206	Basic Plant Biology
213	Weeds Affecting Plants

Outcome #10

1. Outcome Measures

Total production (tons) harvested of hay (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1400000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
206	Basic Plant Biology
213	Weeds Affecting Plants

Outcome #11

1. Outcome Measures

# of clientele who make plant management decisions based on COTMAN

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Irrigation initiation and termination timings have been questioned since irrigation was introduced into cotton production in Arkansas. When is the appropriate time to initiate and terminate irrigation?

What has been done
In 2008 a proposal was submitted to the Cotton Incorporated State Support committee to evaluate the importance of irrigation timing and termination for maximized cotton yields and profitability.

Results
Results from the four year study indicate that the most critical period for irrigation to be initiated is one week prior to bloom in order to maintain the highest level of yield potential. This timing will be most significant in years that experience higher than average heat and drought during the month of June. Average cotton yields over the four year period were increased 80lbs lint per acre when irrigation was initiated one week prior to bloom. In 2011, the yield increase resulted in a $80/acre increase in profitability. The optimum time to terminate irrigation was found to be 450 heat units following cutout (node above white flower 5) unless irrigation was delayed until bloom which resulted in 600 heat units following cutout as the optimum time to terminate irrigation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
201	Plant Genome, Genetics, and Genetic Mechanisms

204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
206	Basic Plant Biology

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.)

Brief Explanation

External factors that impacted outcomes included the following: 1) Program realignment impacted efforts expended in several of the listed planned programs within the Plant and Plant Product - Non-Food Related planned program; 2) Several state defined outcomes were moved from other planned programs to the Plant and Plant Product - Non-Food Related planned program and vice versa; 3) A reduction in staff (FTEs), which reduced the amount of programming in several counties, had a negative impact on program delivery for several segments of this program.

Program activities and outcomes for this program were influenced by market conditions, including rising energy costs, increased production input costs, land grant university funding, the continued downturn in both the national and world economy, and as always, weather conditions. All of these factors had some impact on the Plant and Plant Product - Non-Food Related planned program.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The Division of Agriculture faculty developed, evaluated, and disseminated scientifically derived needs-based programs focusing on boosting agricultural production to meet growing demand and to meet the needs of Arkansas citizens.

Yields in cotton verifications fields that used UA Division of Agriculture recommendations were compared to state averages. 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 this crop increased.

Key Items of Evaluation

Continued diligence by Division of Agriculture faculty to meet needs of citizens and producers.

V(A). Planned Program (Summary)

Program # 7

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
701	Nutrient Composition of Food	0%		10%	
702	Requirements and Function of Nutrients and Other Food Components	10%		65%	
703	Nutrition Education and Behavior	30%		12%	
704	Nutrition and Hunger in the Population	15%		0%	
724	Healthy Lifestyle	25%		3%	
806	Youth Development	20%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	22.0	0.0	3.0	0.0
Actual Paid Professional	26.2	0.0	8.6	0.0
Actual Volunteer	7.7	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**
308094	0	36081	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
361621	0	605981	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2609899	0	236247	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

In Arkansas, thirty-eight percent of school-aged children and 67% of adults are overweight or obese. The percentage is even higher for low-income Arkansans. To address this issue, UA Division of Ag faculty and staff conducted nutrition education programs for Supplemental Nutrition Assistance Program participants in 451 locations throughout the state. Fifty eight counties provided school based-nutrition education for low-income youth in 166 schools. Parents were reached through materials sent home with the children. Other school-aged youth were reached through EFNEP youth groups and 4-H clubs. Younger children and their parents received nutrition education through 35 Head Start Programs. Adult Arkansans in 8 counties participated in a 15-week Reshape Yourself healthy weight program.

Division of Agriculture faculty conducted research to determine the impact of certain functional food components on body weight and factors associated with body weight such as lipid profiles and glucose response.

2. Brief description of the target audience

In order to reach as many Arkansans as possible with nutrition education addressing childhood obesity prevention, the Division of Agriculture targeted a variety of audiences. In general, the following groups were targeted in all of our nutrition education programs:

Youth
Parents
School personnel
Child Care providers
Grandparents
Adults
General public
Federal, State and County Agency employees
Minorities
Researchers
Food manufacturers

More specifically, in all 75 counties, adult and youth participants in the Supplemental Nutrition Assistance Program and those who are eligible to participate were targeted with nutrition education programs aimed at preventing childhood obesity. In addition, the EFNEP program targeted low-income youth and adults in 12 counties. Both of these programs reached out to minority populations.

School personnel in 58 counties benefitted from nutrition education through participation in in-service training and through agents teaching nutrition to their students. Extension agents offered training on nutrition and obesity prevention to child care providers statewide. Adults were targeted for healthy weight classes in 8 counties.

3. How was eXtension used?

UA Extension's professional associations Galaxy Conference featured two sessions on using eXtension and social media to reach new audiences.

State faculty and staff and County FCS agents are members of Family Food and Fitness Community of Practice (FFFCoP)

FFFCoP newsletters and webinar announcements were shared with all county FCS agents.

State faculty and staff participated in FFFCoP webinars.

County FCS agents participated in an eXtension survey.

U of A County FCS agents utilize materials from eXtension for nutrition education programs.

Extension Nutrition webpage has link to Extension Families, Food and Fitness website.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	9132	267205	283487	10602

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	1	10	11

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # grants/contracts funded in support of childhood obesity issues

Year	Actual
2011	9

Output #2

Output Measure

- # news articles, public service announcements, radio and TV media programs in support of Childhood obesity issues

Year	Actual
2011	34

Output #3

Output Measure

- # of 4-H/Youth Food, Nutrition and Health programs delivered related to eating healthy and being active

Year	Actual
2011	15536

Output #4

Output Measure

- # of participants in 4-H/ Youth Food, Nutrition, and Health programs related to eating healthy and being active

Year	Actual
2011	283257

Output #5

Output Measure

- # of funded Fedral grants and/or contracts

Year	Actual
2011	3

Output #6

Output Measure

- # of adult clientele contacts from educational events (educational classes, workshops, group discussions, one-on-one interventions, demonstrations and other educational activities) related to eating healthy and being active

Year	Actual
2011	20475

Output #7

Output Measure

- # of extension educators involved in discussions regarding public and organizational childhood

obesity policies, regulations and industry practices.

Year	Actual
2011	23

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 healthy eating and lifestyles following an educational class, seminar or workshop
2	# of individuals who increased physical activities as a result of completing an Extension program
3	# of participants who adopted one or more positive nutrition practice
4	# of participants reporting reduction in body weight after completing a nutrition education program
5	# of participants who indicated that they intend to adopt one or more positive nutrition practice
6	# of students involved in research focusing on overweight and obesity
7	# of peer reviewed research articles focusing on obesity

Outcome #1

1. Outcome Measures

# of participants who indicated that they increased their knowledge related to healthy eating and lifestyles following an educational class, seminar or workshop

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	11409

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3440

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #3

1. Outcome Measures

# of participants who adopted one or more positive nutrition practice

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	4524

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In Arkansas, approximately 22% of the population receives SNAP benefits. Thirty-eight percent of school-aged children and 67% of adults are overweight or obese. Research shows that a healthy diet can lead to weight loss and lower the risk for heart disease, diabetes and certain types of cancer.

What has been done
SNAP-Ed programs were conducted at 451 locations throughout the state, including public schools, Head Start schools, senior centers, food banks, commodity distribution sites, shelters, DHS offices, WIC offices and grocery stores. Lessons focused on learning how to make healthy food choices within a limited budget, read food labels, cook, grocery shop and increase physical activity.

Results
Parents in 16 counties whose children participated in school-based nutrition projects were surveyed to determine if the SNAP-Ed program was reaching parents through children. Parents surveyed reported the following:

81% reported their child talked to them about healthy foods and snacks.

74% reported their child asked for more or different fruits, vegetables, milk, or yogurt.

64% made changes in their family's eating and/or were more physically active.

Of families that made changes:
66% consumed more fruits and vegetables.

62% were more physically active.

Adults and youth were surveyed to determine if changes in behavior were made after participating in SNAP-Ed. Adults surveyed reported making the following changes:

74% reported they increased knowledge/skills related to food, nutrition and/or food resource management.

70% reported increased ability to balance calories from food and beverages with calories expended.

69% reported they intend to adopt one or more healthy food/nutrition/food resource management practice.

69% reported eating more fruit.

65% reported eating more vegetables.

64% reported eating more whole grains.

63% reported adopting one or more food resource management practice.
Youth surveyed reported making the following changes:

93% reported they increased knowledge concerning one or more healthy food/nutrition practices.

77% reported they intend to adopt one or more healthy food/nutrition practices.

74% reported/demonstrated they more often practice desirable personal hygiene such as hand washing.

51% reported they eat nearer to the recommended number of cup equivalents from the fruit group most days.

48% reported they eat nearer to the recommended number of cup equivalents from the vegetable group most days.

44% reported they eat nearer to the recommended number of cup equivalents of low fat or fat free foods from the dairy group most days.

44% reported increasing physical activity by 30 minutes or more per week.

38% reported they eat nearer to the recommended number of ounce equivalents of whole grains most days.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	154

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Excess body fat is linked to increased risk for cardiovascular disease, diabetes and certain types of cancer. In Arkansas, two-thirds of adults more than one-third of children are overweight or obese. Research shows that even small decreases in weight can lower the risks for these chronic diseases and thus lower health care costs.

What has been done
The UACES offered the 15-week Reshape Yourself program in eight counties in FY11. Participants learned to plan balanced diets based on MyPlate, balance calorie intake with calorie expenditure, read food labels, determine which foods are high in calories and fat, find enjoyable ways to be physically active and many more ideas for maintaining a healthy weight.

Results
Two hundred and forty Arkansans participated in the Reshape Yourself program. The 154 graduates lost a total of 944 pounds. The average weight loss per graduate was 6 pounds.
79% of participants decreased body weight
69% of participants reported an increase in walking activity
49% of participants asked about or screened reported decreased blood pressure
42% of participants asked about or screened reported decreased blood cholesterol
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 $50 was saved per month.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #5

1. Outcome Measures

of participants who indicated that they intend to adopt one or more positive nutrition practice

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual

2011	8184

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #6

1. Outcome Measures

# of students involved in research focusing on overweight and obesity

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	7

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Obesity increases the risk for several chronic diseases including cardiovascular disease and diabetes. Foods rich in phytochemicals with hypolipidemic and hypoglycemic effects have become a central focus in research for prevention of risk factors for obesity-related diseases.

What has been done

In 2011, there were 7 graduate and undergraduate students working on research focusing on overweight and obesity. The studies suggest that the functional components of foods (found in berries and conjugated linoleic acid) improve lipid profiles and glucose response in obese rats.

Further research is needed to determine if functional components will have similar effects in humans.

Results
The studies resulted in 4 peer-reviewed publications in the area of obesity. Results suggest that the functional components of foods (found in berries and conjugated linoleic acid) improve lipid profiles and glucose response in obese rats. This increased knowledge in the area of functional foods and their potential role in improving metabolism and dyslipidemia related to obesity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #7

1. Outcome Measures

# of peer reviewed research articles focusing on obesity

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	11

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Issue
National School Lunch Program (NSLP) and Children's Dietary Outcomes
The effectiveness of the NSLP has come under increasing scrutiny due to the drastic rise in childhood obesity. Since a large number of children eat one meal (lunch) at school each day, measuring the effectiveness of the NSLP is extremely important in order to determine if this program is having an effect on healthy eating habits.

What has been done
Previous studies have provided very mixed findings as to the NSLP's effect on dietary quality of

school children. In this work, Dr. Nayga and his collaborators addressed the problems which have been inherent with previous analyses by designing a new treatment assignment scheme. First, they compared NSLP participants versus non-participants while both accounting for and not accounting for National School Breakfast (NSBP) participation and number of days per week the student participated in the NSLP. Second, they made a more specific comparison by examining NSLP participation and non-participation given program availability at the school while directly controlling for NSBP participation. They further examined whether the NSLP results in any ?residual effect? (i.e., any impact gained from the NSLP even though the participant does not participate) on children that choose not to participate compared to children that do not have an option given that their school does not participate. And third, they utilized both short term (i.e., total consumption, nutrient intake of select vitamins/minerals and the Healthy Eating Index (HEI) and its? component scores) and long term measures (i.e., blood levels of several dietary components) of dietary quality.

Results

Dr. Nayga's findings indicate that the National School Lunch Program participants do not consume a higher quality diet at lunch than children choosing not to participate even though the program is offered, but rather consume a higher quantity of foods while consuming similar amounts at other meals. Furthermore, children attending schools not participating in the National School Lunch Program have dietary outcomes that are not significantly different from program participants. Hence, policies wanting to increase the impact of the NSLP program should perhaps not only place their efforts on increasing quality levels, but should also focus on efforts that lower quantity consumed. For instance, if focus is placed on increasing nutritional quality, then guidelines may need to cut back on quantity and focus more on quality per serving. As noted in the newly released NSLP guidelines, this is what the USDA wants to focus on. The new guidelines set a limit on caloric intake, among other changes, which as noted in this paper should result in decreased food consumption, not a decrease in overall food quality.

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
703	Nutrition Education and Behavior

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

Higher unemployment rates during FY11 increased the number of Arkansans receiving Supplemental Nutrition Assistance Program (SNAP) benefits thus increasing the

need for reaching this target audience.

The current administration's emphasis on healthy lifestyles to reduce childhood obesity within a generation, the new Dietary Guidelines for Americans, the MyPlate and the push for school and community gardens all increased interest in programs addressing healthy eating and obesity prevention.

Economic issues increased the need for programming in other family and consumer science disciplines which may have reduced the amount of time spent addressing childhood obesity prevention. The economy also affected the ability to fill vacant positions throughout the state. Several counties were without Family and Consumer Science educators which reduced programs addressing nutrition and obesity prevention in those counties.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Most nutrition education programs have evaluation tools with similar outcome indicators so that data can be compiled across all nutrition programs. Some programs use pre- and posttests and some use retrospective pre-posttests. The 15-week healthy weight program evaluation is a retrospective pre-posttest and with a section for participants to write their success stories. In some counties handheld audience response devices are used for collecting evaluation data for SNAP-Ed programs. Surveys sent home to parents following school-based nutrition education provide data on whether children share what they have learned with their parents and whether parents make changes to family food patterns based on what the children tell/ask them.

Key Items of Evaluation

Reshape Yourself Healthy Weight Program:

Two hundred and forty Arkansans from 8 counties participated in the **Reshape Yourself** program. The 154 graduates lost a total of 944 pounds. The average weight loss per graduate was 6 pounds.

79% of participants decreased body weight

69% of participants reported an increase in walking activity

49% of participants asked about or screened reported decreased blood pressure

42% of participants asked about or screened reported decreased blood cholesterol

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 $50 was saved per month.

SNAP-Ed Program:

The SNAP-Ed program was delivered in all 75 counties.
Adults surveyed reported making the following changes:

74% reported they increased knowledge/skills related to food, nutrition and/or food resource management.

70% reported increased ability to balance calories from food and beverages with calories expended.

69% reported they intend to adopt one or more healthy food/nutrition/food resource management practice.

69% reported eating more fruit.

65% reported eating more vegetables.

64% reported eating more whole grains.

63% reported adopting one or more food resource management practice.

Youth surveyed reported making the following changes:

93% reported they increased knowledge concerning one or more healthy food/nutrition practices.

77% reported they intend to adopt one or more healthy food/nutrition practices.

74% reported/demonstrated they more often practice desirable personal hygiene such as hand washing.

51% reported they eat nearer to the recommended number of cup equivalents from the fruit group most days.

48% reported they eat nearer to the recommended number of cup equivalents from the vegetable group most days.

44% reported they eat nearer to the recommended number of cup equivalents of low fat or fat free foods from the dairy group most days.

44% reported increasing physical activity by 30 minutes or more per week.

38% reported they eat nearerto the recommended number of ounce equivalents of whole grains most days.

Parents in 16 counties whose children participated in school-based nutrition projects were surveyed to determine if the SNAP-Ed program was reaching parents through children. Parents surveyed reported the following:

81% reported their child talked to them about healthy foods and snacks.

74% reported their child asked for more or different fruits, vegetables, milk, or yogurt.

64% made changes in their family's eating and/or were more physically active.

Of families that made changes:

66% consumed more fruits and vegetables.

62% were more physically active.

V(A). Planned Program (Summary)

Program # 8

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
501	New and Improved Food Processing Technologies	0%		20%	
502	New and Improved Food Products	0%		10%	
503	Quality Maintenance in Storing and Marketing Food Products	0%		2%	
504	Home and Commercial Food Service	35%		5%	
512	Quality Maintenance in Storing and Marketing Non-Food Products	0%		1%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	0%		12%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	65%		45%	
723	Hazards to Human Health and Safety	0%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	3.5	0.0	5.0	0.0
Actual Paid Professional	3.8	0.0	74.7	0.0
Actual Volunteer	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**
62796	0	617960	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
73706	0	6024090	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
531954	0	1752585	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Division of Agriculture faculty and staff develop, evaluate and disseminate education and curricula incorporating research and teaching. Programs include: Quarterly HACCP Roundtables, Food safety and preservation workshops, Better Process Control School, Labeling workshop, ServSafe workshops, Online distance education in food safety and manufacturing, and assistance to small food companies and entrepreneurs in the form of services, workshops, and consulting.

The University of Arkansas Division of Agriculture faculty conduct research to control food-borne pathogens and toxins in the food supply, develop innovative methods to detect, identify and control foodborne pathogens, toxins and contaminants in agricultural production and processing and investigate economical, practical and naturally occurring antimicrobials and other compounds that target food pathogens.

2. Brief description of the target audience

Food Manufacturers
Farmers (Farmer's Markets)
Entrepreneurs and Restaurants
Food Service Employees and/or Food Handlers
Employers & Employees
Health Professionals
Consumers

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	2123	544	10685	538

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	22	22

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)

Year	Actual
2011	337

Output #2

Output Measure

- Number of participants in quarterly HACCP roundtables

Year	Actual
2011	43

Output #3

Output Measure

- Number of ServSafe classes offered

Year	Actual
2011	12

Output #4

Output Measure

- Number of Food Safety clientele contacts from education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational methods

Year	Actual
2011	671

Output #5

Output Measure

- Number of Food Safety education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational events

Year	Actual
2011	90

Output #6

Output Measure

- Numbers of federal grants written and received in food safety.

Year	Actual
2011	3

Output #7

Output Measure

- Number of commodity grants written and received in food safety.

Year	Actual
2011	0

Output #8

Output Measure

- Number of Online Master of Agriculture (Food Safety Emphasis) students enrolled in courses.

Year	Actual
2011	14

Output #9

Output Measure

- Number of all other grants written and funded.

Year	Actual
2011	5

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 of Food Safety following an educational class, seminar or workshop.
2	Number of participants receiving certification in Better Process Control and ServSafe
3	Number of participants who adopted positive safe food handling practices.
4	Number of participants who indicate that they intend to adopt one or more safe food handling practices.
5	Number of food process improvements related to food safety.
6	Number of biosensors developed to detect food pathogens.
7	Reducing the incidence of Foodborne illnesses through cleaning cloths for food contact surfaces

Outcome #1

1. Outcome Measures

Number of participants who indicated that they increased their knowledge related of Food Safety following an educational class, seminar or workshop.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	437

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
none

What has been done
none

Results
none

4. Associated Knowledge Areas

KA Code	Knowledge Area
504	Home and Commercial Food Service
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #2

1. Outcome Measures

Number of participants receiving certification in Better Process Control and ServSafe

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	436

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Arkansas has several nationally recognized food industries that request food safety training for their employees. These food safety educational programs assist food processing companies to remain nationally competitive and prevent foodborne illness.

What has been done
One long standing safety program has been taught annually since 1973 certifying over 2,375 processing employees is the Better Process Control School. This federally mandated training program is very popular in Northwest Arkansas due a number of large canning companies located in the area. The Better Process Control School has been the springboard to many other food safety training programs such as the Food Labeling Workshop, Food Defense Workshop, Microbiological Training Methods Workshop and many other food related workshops which the Food & Drug Administration co-sponsors. In addition, servsafe programs are delivered throughout the state.

Results
In 2011, Better Process Control schools were taught on 3 different occasions and 12 ServSafe classes were taught. 168 people participated in BPCS and 165 of those received certification. There were 337 participants in the ServSafe program with 271 being certified. Although not readily measureable, the Food Safety and servsafe workshops do instill a "food safety culture" in food processing employees which ultimately leads to a reduction in food borne illness and deaths resulting from foodborne illness.

4. Associated Knowledge Areas

KA Code	Knowledge Area
504	Home and Commercial Food Service
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Measures

Number of participants who adopted positive safe food handling practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	404

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Restaurants that serve unsafe food through improper methods of preparation, cooling/reheating and storage of food can make customers of these establishments sick. Since teaching the ServSafe program for the last 17 years, the number of foodborne illness cases reported by individuals has decreased significantly according to Environmental Health Specialists.

What has been done
The ServSafe program was taught to certify and recertify restaurant managers and workers with the goal of reducing the number cases of food borne illness. Extension Agents and Environmental Health Specialists from Union, Columbia and Ouachita Counties conduct training programs for participants in Lafayette, Columbia, Ouachita, Calhoun and Union Counties in February and August.

Results
There were 337 participants in the ServSafe program with 271 being certified. Of the 40 retail food establishments surveyed, 40 reported improved food handling practices within their commercial establishment and 35 adopted one or more recommended food handling and preparation practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area

504	Home and Commercial Food Service
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #4

1. Outcome Measures

Number of participants who indicate that they intend to adopt one or more safe food handling practices.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of food process improvements related to food safety.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Since ground beef processing involves mixing and grinding of beef from different animals, the likelihood of presence of harmful bacteria in the final product is significant. The recent frequent and large numbers of ground beef safety recalls due to possible pathogenic bacterial contamination indicate the continuous need for new and efficient decontamination applications in the ground beef production line. Consumers demand safe products, then again they are unwilling to purchase any color-changed meat products. Therefore, any decontamination method that has a negative impact on meat color characteristics affects consumer purchasing decisions and leads to severe economic losses. Hence, there is a great need to evaluate recent generally recognized as safe (GRAS) approved antimicrobials such as lauric arginate (LA) as single interventions or in combination with existing antimicrobials.

What has been done
Beef trimmings were artificially contaminated with bacteria that can be found in ground beef (E. coli and S. Typhimurium). After leaving the contaminated meat overnight for further bacterial

attachment, the beef trimmings were sprayed with antimicrobial treatments of 5% lauric arginate (LA) alone or followed by 4% sodium metasilicate (NMS), 0.4% cetylpirinidium chloride (CPC), 10% trisodium phosphate (TSP), 0.02% peroxyacetic acid (PA) or Water (W). The treated and untreated control beef trimmings were ground twice and 150g ground beef samples were placed on plastic foam trays with absorbent pads and over wrapped with polyvinyl chloride film. Then ground beef packages were stored under simulated retail conditions and sampled on day 1, 2, 3, 4 and 7 for microbiological and instrumental color evaluations.

Results
The spray application of lauric arginate as single or multiple decontamination interventions with NMS, CPC, TSP, PA or W on contaminated beef trimmings were effective in reducing the microbial populations in subsequent ground beef. However, LA treatment applied in multiple interventions showed more efficient microbial reductions. The results also indicated that LA followed by CPC, NMS, TSP and PA treatments had similar redness in ground beef compared to the untreated samples. Hence, lauric arginate may enhance ground beef safety while maintaining the ground beef redness when applied with CPC, NMS, TSP and PA treatments in multiple chemical decontamination interventions. Further studies are required to evaluate the impact of these treatments on organoleptic properties of ground beef under un-inoculated conditions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #6

1. Outcome Measures

Number of biosensors developed to detect food pathogens.

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Reducing the incidence of Foodborne illnesses through cleaning cloths for food contact surfaces

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Food contact surfaces in delis, food service establishments and processing plants become highly contaminated with fats and protein from the foods pressed against their surfaces so microorganisms can grow to relatively high numbers in a couple of hours at room temperatures. These surfaces are also great sources for transmission of foodborne pathogens. It is absolutely critical to eliminate these bacterial breeding-grounds using appropriate sanitizing tools to minimize cross-contamination during food preparation and/or consumption and to reduce the risk of foodborne diseases.

What has been done
The objective of this study was to compare the removal efficiency of bacteria on food contact surfaces by different cleaning cloths.

Results
Overall a 2.3 to 4.2-log reductions were observed on Formica table surfaces compared to positive control with no cloth cleaning. Scrubbing cloths are designed to physically remove dirt and food residues attached to surfaces; however, they are not ideal to remove bacteria. Remaining bacterial levels after using scrubbing cloths were 2.83 ± 0.46 CFU/cm2, and ATP bioluminescence assay results yielded 503.0 RLU which is an indication of a soiled surface. Terrycloth can retain considerable quantities of water due to their large surface area; however the Terry fabric exhibited low efficiency with a remaining bacterial level of 2.73 ± 0.52 CFU/cm2 recovered, and an ATP assay response of 442.1 RLU. Non-woven cloths are commonly used for wiping tables but are considerably porous with the ability to absorb bacteria from surfaces. These cloths yielded recoverable levels of 2.46 ± 0.51 CFU/cm2 and ATP assay responses of 443.9 RLU. Sponge type cloths consisting of cotton and cellulose contain pores that would allow bacteria to penetrate into the cloth material and yielded recoverable levels of only 1.07 ± 0.76 CFU/cm2 and 208.0 RLU for the ATP test after scrubbing the table surface with this type of cloth, a clear advantage. All cleaning fabrics were thermally treated in a microwave that would be available in food service establishments for 1.5 min at 600W and no bacteria could be recovered from any of the thermally treated fabrics.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration, new cultural groupings, etc.)

Brief Explanation

External factors that impacted outcomes included the following: 1) program realignment impacted efforts expended in some of the listed programs within the Food Safety Program. 2) A temporary reduction in staff (FTEs) resulted in the decrease of statewide programming and research in food safety. 3) A decrease in state budgets has impeded the replacement of staff and the attainment of resources for program implementation.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

Faculty responsible for designing programming content, intervention models, and program evaluation utilized numerous strategies for determining outcome and impacts of their respective educational programming efforts. The types of evaluations applied to these programs are: process-based and outcome-based. Program evaluations are used to: verify and/or increase the impact of the programs offered; improve program delivery; produce data to determine program/activity results; determine program effectiveness. There were 165 participants enrolled in BPCS with 150 participants receiving certification through BPCS. For the ServSafe program, there were 337 participants in the ServSafe program with 276 being certified. Of the 40 retail food establishments surveyed, 40 reported improved food handling practices within their commercial establishment and 35 adopted one or more recommended food handling and preparation practices. Greene County youth was identified as a group falling short on hand washing knowledge. The incidence of illness reported has been higher in the last few years especially during the flu season which resulted in missing school days. The University of Arkansas Cooperative Extension partnered with the Paragould School district in FY10 to teach participants how to properly wash hands, when, and why. The Germ City Tent was used with this demonstration. As a result of the Germ City Tent Program, 90% Teachers reported that the students were washing their hands better, 55% reported sick days were less during the flu season in 2011 than in 2010, and 100% of schools ensured the availability of soap in the bathrooms.

Key Items of Evaluation

Absenteeism was increasing in the Whitten School because of colds and flu like symptoms. Mrs. Smith, the school principal, requested the Germ City program to be delivered in her school.Germ City was conducted in the Whitten School. Material was

provided and sent home with the students.K·4th graders were trained how to wash their hands properly, sneeze into their sleeve and how to prevent germs from spreading. 450 students were reached. Mrs Smith reported that absenteeism improved within the following months and she credits that to the Germ City program.

V(A). Planned Program (Summary)

Program # 9

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%		8%	
102	Soil, Plant, Water, Nutrient Relationships	10%		8%	
112	Watershed Protection and Management	8%		8%	
123	Management and Sustainability of Forest Resources	20%		8%	
133	Pollution Prevention and Mitigation	8%		8%	
136	Conservation of Biological Diversity	5%		8%	
204	Plant Product Quality and Utility (Preharvest)	5%		8%	
402	Engineering Systems and Equipment	8%		9%	
403	Waste Disposal, Recycling, and Reuse	8%		8%	
601	Economics of Agricultural Production and Farm Management	5%		10%	
605	Natural Resource and Environmental Economics	8%		9%	
610	Domestic Policy Analysis	5%		8%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	3.0	0.0	4.0	0.0
Actual Paid Professional	8.5	0.0	28.0	0.0
Actual Volunteer	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**
128046	0	211807	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
150292	0	2023724	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1084687	0	884680	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Develop educational materials, curriculum, & resources
Workshops, meetings
Field Days
Demonstrations
News articles
Newsletter
Web-based Education
Continuing Education
Lab and Field Research
Deliver Services
Provide Training

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

3. How was eXtension used?

Personnel used eXtension as a search engine to enhance their presentations.

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1965	2357	309	5

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	4	12	16

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of programs held related to sustainable energy.

Year	Actual
2011	143

Output #2

Output Measure

- Number of sustainable energy field demonstrations.

Year	Actual
2011	24

Output #3

Output Measure

- Number of field days related to sustainable energy

Year	Actual
2011	26

Output #4

Output Measure

- Number of educational materials & curriculum developed and/or delivered.

Year	Actual
2011	53

Output #5

Output Measure

- Number of sustainable energy events for row crop producers.

Year	Actual
2011	9

Output #6

Output Measure

- Number of sustainable energy events for livestock producers.

Year	Actual
2011	7

Output #7

Output Measure

- Watershed models developed for a watershed of interest.
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- # of individuals engaged in manure-to-energy related consultations

Year	Actual
2011	78

Output #9

Output Measure

- Number of grants received

Year	Actual
2011	2

Output #10

Output Measure

- Number of grant dollars received

Year	Actual
2011	160173

Output #11

Output Measure

- Number of people who attended educational programs and field days addressing the impacts of biofeedstock development.

Year	Actual
2011	153

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	Number of people who increased their knowledge about impact of biofeedstock development on water quality
4	# of livestock clientele who gained knowledge related to manure to energy issues (Short Term)
5	Number of research-related projects providing results about sustainable bioenergy crops

Outcome #1

1. Outcome Measures

Number of landowners indicating an increased understanding of sustainable energy.

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Number of locations for bioenergy crop demonstrations and research fields.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Producers are being exposed to bioenergy crops and sustainable practice.

What has been done
Demonstrations on bioenergy crops and sustainable practices were incorporated into research field days.

Results
Research & Extension field days have been expanded to include demonstrations on sustainable practices. The total number of locations holding research field days or demonstrations was 8.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships

112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources
136	Conservation of Biological Diversity
204	Plant Product Quality and Utility (Preharvest)

Outcome #3

1. Outcome Measures

Number of people who increased their knowledge about impact of biofeedstock development on water quality

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

# of livestock clientele who gained knowledge related to manure to energy issues (Short Term)

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of research-related projects providing results about sustainable bioenergy crops

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
1. Whether energy sorghum is a more suitable biomass crop on which to dispose of poultry litter than switchgrass is explored.

2. Yield data on switchgrass provide guidelines aiding decision-making by prospective biofuel companies on where and how large to site biorefineries in Arkansas.
3. An improved crop simulation model is useful for planning future biorefineries.
4. Increasing switchgrass yields is important to biomass production.
5. Research on herbicide treatment in sweet sorghum will optimize available management resources.

What has been done

Research is in progress. Typical research projects supporting this line of inquiry may include: Assessment and improvement of production of traditional and alternative biomass crops; and integration of sustainable practices with biomass crop production.

Results

1. Preliminary results of research on using poultry litter as a fertilizer for switchgrass and energy biomass sorghum as biomass crops showed that sorghum more effectively responds to litter amendment in terms of biomass yield and macronutrient uptake than does switchgrass.
2. Switchgrass exhibited a high biomass yield potential in several low-fertility and drought-affected sites in Arkansas, indicating excellent prospects for cultivating switchgrass as a crop with high nutrient-use and water-use efficiencies for biofuel production in Arkansas.
3. Crop simulation model ALMANAC is improved for predicting switchgrass biomass yield.
4. The herbicide sulfosulfuron was demonstrated in its ability to control johnsongrass weeds during establishment of switchgrass.
5. Trials in weed control treatments in sweet sorghum identified optimal herbicide and management practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
204	Plant Product Quality and Utility (Preharvest)

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

Brief Explanation

Field-based research and demonstrations are subject to external forces such as available resources, weather and competing policy initiatives. Low rainfall patterns affected research and demonstration plots. While each event may alter hypothesized outcomes, they do provide for real-world situations and data.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

All research projects conducted and report herein utilized standard research methodology protocols. The numbers of demonstrations of these projects at Research and Extension field days, as well as the numbers of attendees, were manually counted.

Key Items of Evaluation

In ongoing research projects being conducted by University of Arkansas Division of Agriculture scientists, the following preliminary results have been found:

1. Preliminary results of research on using poultry litter as a fertilizer for switchgrass and energy biomass sorghum as biomass crops showed that sorghum more effectively responds to litter amendment in terms of biomass yield and macronutrient uptake than does switchgrass.

2. Switchgrass exhibited a high biomass yield potential in several low-fertility and drought-affected sites in Arkansas, indicating excellent prospects for cultivating switchgrass as a crop with high nutrient-use and water-use efficiencies for biofuel production in Arkansas.

3. Crop simulation model ALMANAC is improved for predicting switchgrass biomass yield.

4. The herbicide sulfosulfuron was demonstrated in its ability to control johnsongrass weeds during establishment of switchgrass.

5. Trials in weed control treatments in sweet sorghum identified optimal herbicide and management practices.

Further research in these areas are ongoing.

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Global Food Security and Hunger- Animal 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
111	Conservation and Efficient Use of Water	5%		5%	
112	Watershed Protection and Management	5%		2%	
301	Reproductive Performance of Animals	10%		5%	
302	Nutrient Utilization in Animals	10%		9%	
303	Genetic Improvement of Animals	5%		14%	
306	Environmental Stress in Animals	10%		7%	
307	Animal Management Systems	10%		9%	
308	Improved Animal Products (Before Harvest)	10%		23%	
311	Animal Diseases	10%		14%	
312	External Parasites and Pests of Animals	5%		0%	
313	Internal Parasites in Animals	5%		2%	
601	Economics of Agricultural Production and Farm Management	10%		5%	
722	Zoonotic Diseases and Parasites Affecting Humans	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890
Plan	125.1	0.0	56.1	0.0
Actual Paid Professional	19.2	0.0	85.1	0.0
Actual Volunteer	1.4	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**
318397	0	829783	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
373713	0	9050968	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2697173	0	632890	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

NOTE: Several of the State-Defined Output Measures and State-Defined Outcome Measures that were originally included in this planned program have been moved to other planned programs in the FY11 University of Arkansas Combined Research and Extension Report of Accomplishments and are reported in those planned programs. This is due to the separation and realignment of several of the planned programs originally in the FY11 Plan of Work. Outputs and outcomes originally in this program are reported in the Global Food Security and Hunger - Plants and Natural Resources and Environment planned programs.
****

The Division of Agriculture faculty developed, evaluated, and disseminated needs-based programs that focus on global food security and hunger. Animal agriculture programs in the areas of livestock and poultry are assessed for their ability to deliver and develop needs-based programs to producers, improve efficiency of clientele, and implement deliver new technology to stakeholders. As such, the improved understanding and efficiency of animal systems will boost U.S. animal 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 animal s and animal products. Information was disseminated to consumers, the general public, and livestock and poultry producers. Collaborative University of Arkansas Division of Agriculture research provided new insights in management, production, health, and processing of livestock and poultry.

2. Brief description of the target audience

- 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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	27834	70442	5527	318

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

Year: 2011
Actual: 11

Patents listed
10729658.4 - Lactic Acid Bacteria and Their Use in Swine Direct-Fed Microbials

11100724 - Development of a Universal Vaccine for Eimeria species (protozoal agents) for Animals and Man

11100779.4 - Development of a Universal Vaccine for Parathyroid (non-host-adapted) Salmonella serovars, and Eimeria species (protozoal agents) for Animals and Man

12/945,586 - Morinda Citrifolia Based Antioxidant and Antimicrobial Formulations for Improved Color Stability and Increased Shelf Life of Various Meat Products

61/363,246 - Iodinated Casein and Nutrient In Ovo Injection in Turkey and Chicken Eggs

61/365,188 - Bacterial Isolates for Improved Health of Poultry

61/499,954 - Flooring Challenge Systems and Methods

P 11 01 01181 - Vaccine Vectors and Methods of Enhancing Immune Responses

P11 01 02016 - Vaccine and Methods to Reduce Campylobacter Infection

PCT/US11/39832 - Vaccine and Methods to Reduce Campylobacter Infection

PCT/US11/22062 - Enhanced Immune Responses to Bacillus-vectored Avian Influenza Epitopes

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	41	89	130

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of agronomic production education meetings related to food production
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- # of demonstrations/on-farm research related to food crop production
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- # of farm visits related to food crop production
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- # of row crop field days related to food production
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

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

Output #6

Output Measure

- Dollars of Arkansas Commodity Board Grants received

Year	Actual
2011	170117

Output #7

Output Measure

- Dollars of federal grants and contracts received

Year	Actual
2011	3398969

Output #8

Output Measure

- # of clientele contacts from educational classes, workshops, group discussions, one-on-one interventions, demonstrations, and othe educational methods related to food crop production.
  Not reporting on this Output for this Annual Report

Output #9

Output Measure

- # of livestock or poultry related educational programs, workshops, educational meetings and/or field days.

Year	Actual
2011	302

Output #10

Output Measure

- # of clientele attending livestock or poultry related educational programs (field days, workshops, etc.)

Year	Actual
2011	8317

Output #11

Output Measure

- # of producers receiving livestock or poultry related educational materials (newsletters, fact sheets, etc.)

Year	Actual
2011	26739

Output #12

Output Measure

- # of producers conducting livestock or poultry related on-farm demonstrations.

Year	Actual
2011	118

Output #13

Output Measure

- # of livestock or poultry related farm visits or one-on-one consultations with producers.

Year	Actual
2011	4424

Output #14

Output Measure

- # of clientele trained on agricultural and food biosecurity.

Year	Actual
2011	2133

Output #15

Output Measure

- # of educational materials developed on agricultural and food biosecurity.

Year	Actual

2011	466

Output #16

Output Measure

- # of requested consultations related to exotic animal disease concerns.

Year	Actual
2011	89

Output #17

Output Measure

- # of hits to the CES Website regarding avian biosecurity.

Year	Actual
2011	15527

Output #18

Output Measure

- # of hits to the CES Website regarding livestock biosecurity.

Year	Actual
2011	12200

Output #19

Output Measure

- # of plant sites surveyed or monitored related to biosecurity.
  Not reporting on this Output for this Annual Report

Output #20

Output Measure

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

Year	Actual
2011	316

Output #21

Output Measure

- # of individuals attending manure management related presentations addressing food production.
  Not reporting on this Output for this Annual Report

Output #22

Output Measure

- # of individuals engaged in manure management related consultations addressing food animal prodution.
  Not reporting on this Output for this Annual Report

Output #23

Output Measure

- # of hits at manure management related Webpages addressing food animal production.
  Not reporting on this Output for this Annual Report

Output #24

Output Measure

- # of educational meetings related to environmental control of confined animal housing and energy efficiency improvement.
  Not reporting on this Output for this Annual Report

Output #25

Output Measure

- # of field demonstrations related to environmental control of confined animal housing and energy efficiency improvement.
  Not reporting on this Output for this Annual Report

Output #26

Output Measure

- # of food production alternative agricultural systems related education classes, workshops, group discussions, and other educational events.
  Not reporting on this Output for this Annual Report

Output #27

Output Measure

- # of food production alternative agricultural systems related demonstrations (e.g.,demonstration study farm, food plots, etc.)
  Not reporting on this Output for this Annual Report

Output #28

Output Measure

- of grants written and funded in support of food and nutrition programming and research.
  Not reporting on this Output for this Annual Report

Output #29

Output Measure

- # of food and nutrition 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

Output #30

Output Measure

- of food and nutrition education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational events,
  Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Total production (bushels) of harvested wheat (all).
2	Total production (bushels) of harvested soybeans (all).
3	Total production (cwt) of harvested rice (all).
4	Total production (bushels) of harvested corn in Arkansas.
5	Total production (bushels) of sorghum harvested in Arkansas.
6	# of samples submitted for plant testing related to food production.
7	# of clientele (non-duplicated) who use the DD50 program for improved rice production.
8	# of clientele using the RICESEED program.
9	# of clientele that utilize SOYVA to assist with variety selection.
10	# of livestock producers who increased knowledge related to livestock production management practices.
11	# of livestock producers who adopted a new practice.
12	# of livestock producers who initiated or improved their record keeping.
13	# of poultry producers who adopted new practices or technology.
14	# of allied poultry industry personnel who adopt new practices or technology.
15	# of livestock producers who changed an existing management practice.
16	# of clientele who reported knowledge gained related to aquaculture.
17	# of clientele who adopted new aquaculture practices.

18	# of growers/producers reporting knowledge gained about the need for biosecurity.
19	# of growers/producers reporting intent to adopt new biosecurity practices for animal production facilities.
20	# of growers/producers adopting new practices outlined in educational programs to improve biosecurity through proper methods of sanitation, disease prevention, recognition, and control.
21	# of diagnostic plant pest samples submitted.
22	# of diagnostic nematode samples submitted.
23	# of avian samples submitted to diagnostic labs for exotic animal surveillance disease testing.
24	# of Asian Soybean Rust positive samples.
25	# of livestock samples submitted to diagnostic labs for exotic animal diseases testing.
26	# of livestock clientele who gained knowledge about manure management issues related to food production.
27	# of livestock clientele who implemented improvements in their manure management practices related to food species production.
28	# of participants indicating increased knowledge of energy efficiency improvement in confined animal housing.
29	# of clientele who reported knowledge gained about alternative food products.
30	Value of alternative agricultural food products sold ($1000).
31	# of acres of alternative food products planted.
32	# of clientele who initiated an alternative agricultural food-related enterprise.
33	# of farms selling alternative agricultural food-related products or services by various methods, such as farmers markets.
34	# of clientele who used program information to decide NOT to initiate an alternative food-related enterprise.
35	An estimate of the potential impact of global climate change on corn production.
36	# of participants who indicated that they increased their knowledge related to food, nutrition and/or food resource management following completion of a nutrition education program.

37	# of participants who adopted at least one positive nutrition practice.
38	# of participants who indicated that they intend to adopt one or more healthy food/nutrition/resource management practice.
39	# of participants who adopted at least one food resource management practice.
40	# of participants who reported saving money on groceries following completion of a nutrition education program.
41	# of participants who reported they less often run out of food before the end of the month following completion of a nutrition education program.

Outcome #1

1. **Outcome Measures**

Total production (bushels) of harvested wheat (all).

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Total production (bushels) of harvested soybeans (all).

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Total production (cwt) of harvested rice (all).

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Total production (bushels) of harvested corn in Arkansas.

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Total production (bushels) of sorghum harvested in Arkansas.

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

# of samples submitted for plant testing related to food production.

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

# of clientele (non-duplicated) who use the DD50 program for improved rice production.

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

# of clientele using the RICESEED program.

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

# of clientele that utilize SOYVA to assist with variety selection.

Not Reporting on this Outcome Measure

Outcome #10

1. Outcome Measures

# 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

3b. Quantitative Outcome

Year	Actual
2011	8948

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 2011, 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 presented to producers who once again understand 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 2012.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
601	Economics of Agricultural Production and Farm Management

Outcome #11

1. Outcome Measures

# of livestock producers who adopted a new practice.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1925

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 an 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 adopted.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
601	Economics of Agricultural Production and Farm Management

Outcome #12

1. Outcome Measures

# of livestock producers who initiated or improved their record keeping.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	766

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 letter 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

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management

Outcome #13

1. Outcome Measures

# of poultry producers who adopted new practices or technology.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual

2011	23

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
306	Environmental Stress in Animals
311	Animal Diseases

Outcome #14

1. Outcome Measures

# of allied poultry industry personnel who adopt new practices or technology.

Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

# of livestock producers who changed an existing management practice.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	2092

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management

Outcome #16

1. Outcome Measures

# of clientele who reported knowledge gained related to aquaculture.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals

302	Nutrient Utilization in Animals
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases
601	Economics of Agricultural Production and Farm Management

Outcome #17

1. Outcome Measures

# of clientele who adopted new aquaculture practices.

Not Reporting on this Outcome Measure

Outcome #18

1. Outcome Measures

# 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

3b. Quantitative Outcome

Year	Actual
2011	819

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The total farm value of poultry and crops in Arkansas is over 5 billion dollars with poultry a major agricultural product. Biosecurity and early disease recognition continue to be the mainstay for prevention and control of disease.

What has been done
Biosecurity enhancement measures have been 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. Prevention and/or reduction in the incidence of disease can result in savings of millions of dollars.

Results

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

KA Code	Knowledge Area
311	Animal Diseases
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #19

1. Outcome Measures

# 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

3b. Quantitative Outcome

Year	Actual
2011	387

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #20

1. Outcome Measures

# 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 Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	218

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #21

1. Outcome Measures

# of diagnostic plant pest samples submitted.

Not Reporting on this Outcome Measure

Outcome #22

1. Outcome Measures

# of diagnostic nematode samples submitted.

Not Reporting on this Outcome Measure

Outcome #23

1. Outcome Measures

# of avian samples submitted to diagnostic labs for exotic animal surveillance disease testing.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Poultry, a major agricultural product in Arkansas, is valued at close to 3 billion dollars and represents a significant part of the state economy. New and continued foreign animal disease threats, the continued threat of Agroterrorism, and the concern over a possible pandemic Influenza outbreak have necessitated increased awareness of diseases and the efforts to monitor for and prevent them.

What has been done
Poultry integrators continue routine Avian Influenza serological monitoring/surveillance efforts on poultry flocks of poultry with over 300,000 samples tested in 2011 as part of the National Poultry Improvement Plan.

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. This year only one sample (case) was referred to the National Veterinary Services laboratory for additional testing for an avian foreign disease. This case was negative for a foreign animal disease.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #24

1. Outcome Measures

# of Asian Soybean Rust positive samples.

Not Reporting on this Outcome Measure

Outcome #25

1. Outcome Measures

# 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 Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	10

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 approximately 19% of all employment with almost 1 million jobs. Exports represent roughly 23% of all animal production and over 140 billion dollars. The continued threat of the entry of a foreign animal disease (FAD) such as ?foot and mouth disease? and the threat of Agroterrorism against the United States animal population is such that vigilance is needed to prevent accidental entry of an FAD or the use of infectious diseases as a weapon against the

United States food supply. Exotic disease outbreaks in Arkansas or in the United States could result in a quarantine of animal and/or poultry products severely impacting the economy of the state and individual growers/producers in particular.

What has been done
Education of growers, individuals, farm and ranch owners, and producers on disease recognition vigilance, and Biosecurity practices greatly assists the current efforts and vigilance of animal health professionals.

Results
This year 10 samples (cases) were sent to the National Veterinary Services laboratory for additional testing for foreign animal disease. All 10 samples were negative for a foreign animal disease.

4. Associated Knowledge Areas

KA Code	Knowledge Area
311	Animal Diseases
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #26

1. Outcome Measures

# of livestock clientele who gained knowledge about manure management issues related to food production.

Not Reporting on this Outcome Measure

Outcome #27

1. Outcome Measures

# of livestock clientele who implemented improvements in their manure management practices related to food species production.

Not Reporting on this Outcome Measure

Outcome #28

1. Outcome Measures

# of participants indicating increased knowledge of energy efficiency improvement in confined animal housing.

Not Reporting on this Outcome Measure

Outcome #29

1. **Outcome Measures**

   # of clientele who reported knowledge gained about alternative food products.

   Not Reporting on this Outcome Measure

Outcome #30

1. **Outcome Measures**

   Value of alternative agricultural food products sold ($1000).

   Not Reporting on this Outcome Measure

Outcome #31

1. **Outcome Measures**

   # of acres of alternative food products planted.

   Not Reporting on this Outcome Measure

Outcome #32

1. **Outcome Measures**

   # of clientele who initiated an alternative agricultural food-related enterprise.

   Not Reporting on this Outcome Measure

Outcome #33

1. **Outcome Measures**

   # of farms selling alternative agricultural food-related products or services by various methods, such as farmers markets.

   Not Reporting on this Outcome Measure

Outcome #34

1. **Outcome Measures**

   # of clientele who used program information to decide NOT to initiate an alternative food-related enterprise.

   Not Reporting on this Outcome Measure

Outcome #35

1. **Outcome Measures**

   An estimate of the potential impact of global climate change on corn production.

   Not Reporting on this Outcome Measure

Outcome #36

1. **Outcome Measures**

   # of participants who indicated that they increased their knowledge related to food, nutrition and/or food resource management following completion of a nutrition education program.

   Not Reporting on this Outcome Measure

Outcome #37

1. **Outcome Measures**

   # of participants who adopted at least one positive nutrition practice.

   Not Reporting on this Outcome Measure

Outcome #38

1. **Outcome Measures**

   # of participants who indicated that they intend to adopt one or more healthy food/nutrition/resource management practice.

   Not Reporting on this Outcome Measure

Outcome #39

1. **Outcome Measures**

# of participants who adopted at least one food resource management practice.

Not Reporting on this Outcome Measure

Outcome #40

1. **Outcome Measures**

# of participants who reported saving money on groceries following completion of a nutrition education program.

Not Reporting on this Outcome Measure

Outcome #41

1. **Outcome Measures**

# of participants who reported they less often run out of food before the end of the month following completion of a nutrition education program.

Not Reporting on this Outcome Measure

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.)

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, 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)

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, 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 and directions. Many educational meetings, workshops and activities 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 agriculture production efficiency and sustainability and hunger 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 # 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%		5%	
102	Soil, Plant, Water, Nutrient Relationships	0%		10%	
111	Conservation and Efficient Use of Water	0%		5%	
112	Watershed Protection and Management	0%		3%	
123	Management and Sustainability of Forest Resources	0%		3%	
131	Alternative Uses of Land	0%		1%	
132	Weather and Climate	0%		1%	
133	Pollution Prevention and Mitigation	0%		5%	
136	Conservation of Biological Diversity	0%		2%	
141	Air Resource Protection and Management	0%		15%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		20%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		5%	
205	Plant Management Systems	0%		6%	
302	Nutrient Utilization in Animals	0%		2%	
306	Environmental Stress in Animals	0%		2%	
307	Animal Management Systems	0%		4%	
402	Engineering Systems and Equipment	0%		2%	
601	Economics of Agricultural Production and Farm Management	0%		5%	
605	Natural Resource and Environmental Economics	0%		4%	
	Total	0%		100%	

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2011	Extension		Research	
	1862	1890	1862	1890

Plan	0.0	0.0	10.0	0.0
Actual Paid Professional	0.0	0.0	43.6	0.0
Actual Volunteer	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	395700	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
0	0	500648	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
0	0	1063493	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Basic and applied research efforts are being conducted in the areas of life cycle analyses for dairy(milk), cotton, and swine production; temperature stress in rice, cotton, and poultry; greenhouse gas emissions from natural and managed agroecosystems and from alternative-fuel-powered engines; assessment of soil carbon storage and sequestration in natural and managed agroecosystems; efficient water and nitrogen use in rice; and on projections of economic impacts of climate-adaptive practices on crop production.

2. Brief description of the target audience

Based on the research activities involving Climate Change, target audiences of those efforts include swine, rice, soybean, cotton, forest product, and organic apple producers; policy makers in various governmental agencies (i.e., USDA, USEPA, USDOE), supply-chain managers (i.e., consumer package goods, WalMart, Krogers, Safeway); foresters; county extension agents; and research scientists.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2011	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	95	210	0	0

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

Patent Applications Submitted

Year: 2011

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2011	Extension	Research	Total
Actual	0	9	12

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of publications.

Year	Actual
2011	16

Output #2

Output Measure

- Funded research amounts (in dollars).

Year	Actual
2011	5600000

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of metrics developed for greenhouse gas emissions in agriculture.
2	Life cycle inventory methodology and data for row crops for greenhouse gases.
3	Reduction of row crop agriculture in the US on biodiversity.

Outcome #1

1. Outcome Measures

Number of metrics developed for greenhouse gas emissions in agriculture.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
In 2010, U.S. dairy farmers produced 193 billion lbs. of milk, worth $36.9 billion. The U.S. dairy industry has increased production through improved genetics and management practices. Yet dairies impact the environment by releasing waste compounds, including nitrogen & phosphorus into water and methane, ammonia, nitrous oxide & volatile organic compounds into air. These compounds are released in the flow of nutrients through the crop-animal-manure cycle. Methane and nitrous oxide are greenhouse gases (GHG), measured in CO2 equivalents (CO2e).

What has been done
The project funded by Dairy Management Inc. has increased understanding of sources of GHGs and revealed strategies for reducing them. This project included liquid milk and cheese production, and encompassed cradle to grave scope. Comprehensive Life Cycle Assessments (LCAs,) based on surveys of US producers, processers, & retailers, were completed in 2011. These LCAs provided the foundation for understanding and providing innovative solutions for this problem.

Results
The project revealed that approximately 35 Tg of CO2e were produced by U.S. dairy cattle in 2007, which contributed 25% of total livestock CO2e emission. Representing approximately 80% of the dairy cattle in the U.S., the Innovation Center has committed to reducing total dairy greenhouse gas (GHG) emissions by 25% per unit of milk production by 2020. Feed production, enteric methane, and manure management offer the largest opportunities to meet this goal. Enteric and manure GHG emissions (primarily methane and nitrous oxide) totaled over 45% of the total dairy farm CO2e budget; these GHG emissions are integrally related to efficiency of capture of manure carbon and nitrogen into row crops and forages for the dairy enterprise. Seven peer-reviewed manuscripts have been submitted (4 in print) for this body of work.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
132	Weather and Climate
141	Air Resource Protection and Management
302	Nutrient Utilization in Animals
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management
605	Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

Life cycle inventory methodology and data for row crops for greenhouse gases.

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Reduction of row crop agriculture in the US on biodiversity.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2011	1

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The impact of human activity on biodiversity is accepted as a great threat to global ecosystem integrity. Consumers, food manufacturers, retailers & other stakeholders are interested in a sustainable, secure, safe product supply chain. A comprehensive view of direct and indirect services offered by a product is sought. Recipients of ecosystem services include industry,

society, & the environment. Industry includes agriculture, manufacturing, mining, electricity, and water supply.
Distribution of ecosystem services are not uniformly distributed across the landscape and demands are changing, resulting in increased scarcity or loss of ecosystem services. The users of ecosystem services have different needs over time and space, resulting in competition for services that may become stressed or scarce. Management and restoration of ecosystem services at the ecoregion scale is necessary to ensure sustainable supply and minimize impacts on the environment.

What has been done
Agriculture was segregated from other industrial users of ecosystem services, as it is the largest user of water (76%) and the largest occupier of land (43%) globally. The impact of using ecosystem services can result in degradation of other services or unsustainable consumption of existing services. Ecosystem services for a dairy farm in the Ozark Plateau were compared with county averages for Benton County, Arkansas, using estimated land use distributions and associated characteristics.

Results
Life Cycle Assessment (LCA) is an effective tool for evaluating a production system including the full supply chain. LCA can be used to identify areas for innovation, reveal input efficiencies, regional environmental impacts & communicate with stakeholders across the value chain. Usually applied to measuring impacts and damages, LCA can be extended to measure benefits associated with ecosystem services and evaluate potential consequences of changes in levels of service or alternative services. Our assessment of ecosystem services offered by an archetypical dairy farm showed that, for the landscape, ecosystem service including biodiversity increased over the past 200 years, due in large part to the increased forested area in the Ozark Plateau ecoregion. This LCA is in print.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Other (Global climate change)

Brief Explanation

Activity in Climate Change is in its infancy among Arkansas research and extension professionals. A critical mass of data and interpretation is required before outcomes can be accurately reported. There is simply nothing to report at this time. We anticipate that Public Policy and Appropriations will affect the outcomes in the future.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

The Climate Change research projects are ongoing and impacts will be reported in subsequent years.

When the time is appropriate data on outputs and outcomes will be collected from Faculty Impact Statements and Faculty Service Reviews.

Evaluation studies will be conducted in future years by examining results of completed research studies. Key data will be collected regarding publications, the adoption of various programs, citations of publication, among others.

Key Items of Evaluation

Outputs and outcomes are collected from Faculty Impact Statements and Faculty Service Reviews and evaluations are conducted based upon conclusions from research. In the futre, we anticipate that extension education programs will be the source of key data regarding adoption of climate mitigation practices or practices which are adapted to climate change realities.