

2009 University of Arkansas Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

Agriculture is vital to the diverse economy of Arkansas as well as to our very identity as "The Natural State." Over a quarter of a million Arkansans work in jobs generated by Arkansas agriculture and these workers receive approximately 15 percent of the state's total labor income. Agriculture powers the Arkansas economy. Including multiplier effects, agriculture provides \$15 billion or approximately 16 percent of all value-added in Arkansas. Value added includes payments to workers plus indirect taxes and other property-type income such as payments for rents, royalties and dividends. Agriculture provides one in every six jobs or a total 268,617 jobs. Labor income is estimated at \$9.16 billion or more than 15% of the state's total labor income.

Arkansas has 49,346 farms on 13,873,000 acres and ranks 12th nationally in total farm cash receipts. Arkansas ranks 5th in softwood lumber production, with about 18,000,000 acres of forest land representing approximately 54 percent of the total land base. Arkansas is the largest producer of rice in the nation and ranks in the top 25 states for the production of 20 different agricultural commodities.

Arkansas agriculture contributes a larger share to the state's Gross Domestic Product than does agriculture in neighboring states and the U.S. economy. Excluding multiplier effects, agricultural production, processing and retail accounts for 12 percent of the Gross Domestic Product for our state. This compares to about 7 percent for the southeast U.S., and 5 percent nationwide. (Source: Computed from U.S. Department of Commerce, Bureau of Economic Analysis, Regional Accounts Data, 2008)

Throughout the 2009 cropping season Arkansas producers were challenged by a wet spring, dry June, and then excessive rainfall again from July through harvest. A team of economists monitored the delayed harvest and crop losses throughout the 2009 fall and into winter. The team issued periodic estimates of the value of crop losses. The final report issued January 25, 2010 estimated total crop losses at \$397 million. In addition to the direct loss of \$397 million, the economic loss has reduced economic activity beyond the farm-gate. The additional loss to the value added (Arkansas gross state product) is estimated to be nearly \$202.7 million, for a total of \$599 million.

Arkansas is a rural state and the recent recession exacerbated the loss of non-agricultural jobs in rural areas of the state. Many rural residents, including the majority of farm households, are dependent on these off-farm jobs for their livelihood. The rural areas of Arkansas lost approximately three percent of their jobs between 2008 and 2009. The loss of rural employment opportunities has resulted in declining rural populations and a declining tax base which has had a debilitating effect on local governments. Local leadership, strategic planning (Breakthrough Solutions), business assistance (APAC) and entrepreneurship programs were tailored to assist rural communities and regions maintain and create new jobs that utilize local resources.

As part of the state-wide Governor's Task Force for Dislocated Workers, Extension also partnered with diverse stakeholders throughout 2009 to assist Arkansas consumers who found themselves dealing with significant income loss. The role of this multi-agency task force was to provide information for employees in companies that were facing major lay-offs or plant closings. The Extension publication, *Living Resourcefully with Reduced Income*, was revised and updated. A new suite of materials was developed entitled *Stretch Your Dollar*; these targeted education resources were developed for consumers regarding household budgeting principles. An online site was created for agent resources; financial management information and education was delivered by family and consumer science county agents at dislocated worker events. Financial management education was conducted in 13 counties for several hundred dislocated workers. In Phillips County, where the program was developed, 312 consumers reported saving more than \$11,000 using coupons between March and September 2009.

Adding "energy" to food and fiber as farm commodities has helped energize the agricultural sector of the Arkansas economy. For the past two years Arkansas row-crop farmers have been riveted to the Chicago Board of Trade box scores for the futures markets. They tell a fascinating story. Demand for corn to produce ethanol and for soybeans and animal fat for biodiesel have contributed to the high commodity prices, which are monitored and analyzed by Division agricultural economists. In just two years, corn and wheat prices tripled, while rice and soybeans more than doubled. On the flip side, the 2008 crops were the most expensive ever grown. Input costs have challenged Arkansas producers to improve efficiency in

every way possible. The Division's Global Rice Marketing and Policy Program provides analysis and leadership for the multi-state Food and Agricultural Policy Research Institute (FAPRI).

While farmers experienced a large increase in commodity crop values, livestock producers felt the most significant effect in prices paid for feed. On May 14, 2008 a new Division of Agriculture research and demonstration facility was dedicated for byproducts feeds research with a targeted outcome to reduce cattle feeding costs. High feed and fuel prices likewise hit Arkansas catfish farmers at a time when market prices were depressed due to imports from China and Vietnam. The pond acreage in Arkansas declined about 2,000 acres to 28,000 and is expected to be much lower this next year. The housing slump and rising fuel prices have likewise suppressed the timber industry, which is one of the leading Arkansas employers.

Tremendous growth in Hispanic immigration during the last decade has driven a dramatic shift in the ethnic landscape of Arkansas. The Hispanic population has risen more than 500 percent since 1990. Division of Agriculture family and consumer science programs have been adapted and translated to meet the emerging needs of this evolving and growing clientele. The Expanded Food and Nutrition Education Program is designed through adaptations to serve the ethnic needs of Hispanic families. EFNEP teaches families on a limited income how to provide a healthy, nutritious diet. All of the EFNEP literature and lessons have been translated into Spanish. More Extension programs are on the drawing board or starting up for this target audience, including youth development and entrepreneurship programs.

During 2009 the Arkansas 4-H program continued its commitment of building outstanding leaders with marketable skills to succeed in today's global society. One hundred thirty-one thousand, eight hundred and fifty Arkansas youth, or 25% of the K-12 state population participate in 4-H. Through the efforts of a dedicated statewide network, 4-H offers educational programs, experiential learning experiences and scholarships for members, leaders and families. Volunteers are very instrumental in the delivery of the 4-H program. In 2009, there were 9,660 youth and adult 4-H volunteers. These volunteers contributed over one million hours, which is valued at 20.25 per hour. The 2009 estimated value of 4-H volunteers was 19 million dollars.

During FY09 the Arkansas Division of Agriculture addressed a multitude of cross-cutting issues, though a broad range of research and Extension programs. An increasing number of the Divisions' efforts are multi-disciplinary and integrated. An overview of the key impacts across program areas is provided below.

Families Youth and Communities

The scope of work for the University of Arkansas, Division of Agriculture includes comprehensive programming addressing life cycles that strengthen families, develop children and bind us to healthy, productive communities. Through Community Development, Family and Consumer Sciences programs and 4-H Youth Development, the Division helps keep Arkansans healthy and strong from youth to maturity.

Making healthy choices can be extremely challenging in today's society. Whether it is obesity, eating healthier, managing resources effectively, physical activity, healthy relationships, child care, food safety or health and wellness, they all present themselves as challenges for families at some point. The Division's faculty and staff in the Family and Consumer Sciences arena partner with state agencies, federal partners, UAPB-1890, community leaders, business and industry representatives to address pressing issues that impact the overall wellness of Arkansans. Through partnerships, the dedication and expertise of faculty and staff at all levels help families find solutions to address their problems.

Reshape Yourself - It's estimated that 61 percent of adult Arkansans are overweight or obese. To help correct the problem, the Division of Agriculture provided a 15-week program, Reshape Yourself, teaching adults that even small changes in usual practices can lead to big results. The program emphasizes a three-part approach to weight management: sensible, balanced diet; regular physical activity; and making long-term behavior changes. Reshape Yourself was conducted in 13 counties during the 2009 fiscal year. Of the counties reporting program outcomes, 219 Arkansans participated in the program. A total of 2,418 pounds were lost by graduates, and they logged more than 18,109 miles walking. Participants saw a reduction in their blood pressure, cholesterol and glucose, and 26 percent of participants on medication before beginning the program reported their doctor reduced or eliminated prescribed medication as a result of lifestyle changes made during the program.

Diabetes Program- In FY09, 20 county FCS agents reported reaching 720 Arkansas through the Living Well with Diabetes program. As a result of their participation 97% increased their knowledge about diabetes and diabetes management practices and 83% reported improvement in diabetes management practices.

Strong Women - An important part of losing weight and staying healthy is increasing physical activity. By adding weight

resistant training to a fitness program, women can enjoy health benefits in addition to losing weight. The Strong Women program is a comprehensive fitness program helping participants improve bone density, balance and strength through exercising. During the past fiscal year, we had 40,840 participation contacts in counties across the state. When it came time to measure success, more than 65 percent of participants increased their strength and 60 percent increased their flexibility, balance, and aerobic endurance.

Body Walk - The Body Walk is a 30-feet by 36-feet walk-through exhibit of the human body. It teaches healthy behaviors to children from kindergarten through the fourth grade. The purpose is to help reduce the incidence of obesity and chronic disease caused by poor eating habits, substance abuse and lack of exercise. The program is a proven and effective educational tool and reached more than 17,715 Arkansas youth in 69 schools during the 2008-09 school year. Teachers received classroom activities for use prior to and following the travel through the body. Students received a take-home activity book to read with their families.

Fit in 10 - Fit in 10 is an exercise program based on research that answers the question of "what type and how much exercise". Fit in 10 has two main components, a fitness video and corresponding Fact Sheets. The DVD is a full length fitness video divided into the recommended 10 minute segments of the four types of exercise. The video is designed where the viewer can pick and choose which segment to watch or "play all" for 40 minutes of continuous exercise. In addition, there is a "Bonus" feature of 10 minutes of Tai Chi. The Tai Chi segment is endorsed by the Arkansas Chapter of the Arthritis Foundation. From June until December 2009, the Fit in 10 DVD sold 744 copies. We are unable to account for Fact Sheets being downloaded manually, however, in the same time frame 5,562 Fact Sheets from the Fit in 10 Series were ordered.

Walk Across Arkansas (WAA) - Walking is an effective low impact activity that almost anyone can utilize to stay healthy, and even lose weight. WAA is a friendly statewide competition for teams of 8, which lasts 8 weeks. It is offered twice a year. WAA provides measurable results of impact (based on miles walked measured with pedometers). The 3,156 individuals who participated in WAA in the past fiscal year have potentially saved the state **\$797,540** in health care costs (based on 198,770 total miles walked collectively in 2009). Members enjoy the friendly competitiveness and reported increasing energy, weight loss, lowered blood pressure and cholesterol and even better control of glucose. This program is a great low-cost fun motivator for improving Arkansans' quality of life.

Food Labeling and Obesity - Due primarily to increasing obesity rates, many countries around the world have mandated, or plan to mandate, nutrition related information on most pre-packaged food products. Health advocates and lobbyists would also like to see similar laws in the food away from home (FAFH) market. For example, New York City now requires all chain restaurants with 15 or more establishments anywhere in the US to show calorie information on their menus and menu board. The benefits are estimated to be as much as 150,000 less obese New Yorkers over the next five years. But does nutritional label use really influence body weight outcomes? A team led by economist Dr. Rudy Nayga used the latest available dataset from the US National Health and Nutrition Examination Survey (2005-2006) to explore if reading such nutrition information really has an effect on body weight outcomes. The results generally suggest that nutritional label use does not affect body mass index. There has been a lot of debate lately on whether to initiate mandatory nutritional labeling regulations in the FAFH market due to high obesity rates in the US. Since the current Nutritional Labeling and Education Act (NLEA) in the US is only for the food at home market, it is not clear if mandatory nutritional labelling in the FAFH market is warranted given our findings. Future studies should attempt to definitively assess the possible reasons why reading nutritional labels would not reduce BMI.

TV Viewing and Obesity - Childhood obesity is becoming a very important issue in many countries. Research was conducted to assess the effects of TV viewing hours and fast food consumption on children's body weight and the risk of being overweight and obese. Economist Dr. Nayga and his team took a different approach than many previous studies. First, they captured the potential interrelation between these two activities (TV watching and fast food consumption) and account for the censoring (zero observation) problem of TV viewing hours and fast food consumption that may occur in the household survey data. In addition, they examined the extent to which these two activities may have different effects on children's body weight and the risk of being overweight and obese. Their research findings revealed some interesting policy implications. First, they found a statistically significant relationship between hours spent on TV viewing and fast food consumption. Second, they also found different effects of these two activities on children's body weight and the risk of being overweight or obese. TV viewing hours and fast food consumption positively affects body weight and the risk of being overweight. While these results are not very surprising and consistent with prior expectations, they point to the importance of limiting children's TV viewing hours and fast food consumption to control body weight and the risk of being overweight among children. These findings have significant implications for public health policies/programs. First, they suggest that public health and childhood obesity programs should educate parents of the critical influence of TV viewing and fast food consumption on childhood obesity. These programs should provide concrete and understandable guidelines for parents that reflect the potential consequences of excessive TV viewing and fast food consumption.

Food Safety - The food production and processing industry is significant to the economy of Arkansas, a strong research and extension base in food safety is of paramount importance. Arkansas food safety programs focus on the production, processing, distribution, and preparation of food. Better Process Control School (BPCS) and ServSafe® help the food industries implement food safety systems and comply with state and federal regulations. In 2009, 48 participants were enrolled in BPCS with 40 receiving certification. Two hundred and one food handlers were certified through ServSafe®.

Be MedWise Arkansas - Medication misuse taxes our health care system by over \$177 billion a year, resulting in extra physician visits, avoidable medication side effects, loss of productivity on the job, prolonged or exacerbated illnesses (sometimes life-threatening), unnecessary emergency room visits, hospitalization and even death. The Division of Agriculture launched a medication literacy awareness program in collaboration with the National Council on Patient Information and Education and the University of Arkansas for Medical Sciences to educate Arkansans about proper medication use. During the past fiscal year, 683 Arkansans participated in a Be MedWise class; a participant survey reflected that 81% used an over the counter medication, 70% used both prescription and over the counter medications simultaneously, only 39% read the drug facts label, and 28% consistently overdosed on medication. Since taking the class, 99.4% of participants reported that they understood the importance of reading drug facts labels and 98.1% likewise learned and understood the importance of taking the recommended dose. Many participants reported that one of the things they learned was that their pharmacist was a convenient local and immediate resource they could use to ask drug-related questions especially when it was difficult to get through to their doctors.

Child care professionals reveal needs - A survey of child care professionals provided a wealth of data on the extent to which they felt competent in various aspects of their work with children. This data set is being used to study factors such as educational levels, training in child development, years in child care, job benefits needed and degree of competency. Results will help inform policymakers of ways to improve child care services.

Best Care - Division specialists, technicians and support staff developed 10 hours of multi-disciplinary child care provider training with a new research-based curriculum written in 2009. The curriculum addressed topics in key subject-matter areas, including resource management, nutrition, health and safety and child development. The program was offered free of charge through extension county agents. The training is designed for parents, early childhood professionals who need verified hours to maintain licensure and others working with young children. During the past fiscal year, more than 3,078 participants went through the Best Care program. Sixty-four percent of participants indicated they intended to adopt recommended practices, as a result of attending a Best Care Training.

Best Care Connected is an online course providing five hours of free verified training to Arkansas child care providers. The course was offered two times during FY2009. Participants studied the lessons and completed quizzes online. Five one-hour lessons were developed in the areas of child development, health and safety, and food and nutrition. Participants must receive a passing score on every quiz in order to complete the five hours of training. During 2009 1,065 child care providers completed the Best Care Connected course.

ATV Safety - Arkansas averages more than 15-20 ATV-related deaths every year and has one of the nation's highest rates of injury for youth 16 years and younger. In Arkansas, we ride ATVs for work and recreation, so knowing the safe way to ride can save a life or a trip to the emergency room. 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 the ATV's. Through the 4-H program 21 Division faculty and staff were trained to teach the five-hour safety ASI RiderCourse so that they may then administer the program to the youth and adults in their counties. In addition to this training, approximately 100 community learners were trained to deliver ATV safety information to their communities. Over 10,000 youth participated in school or communities programs. Six hundred plus youth and adults have gone through the five-hour hands-on RiderCourse. This program is funded through National 4-H Council through sponsorship of the ATV Safety Institute. Arkansas partners are Arkansas Children's Hospital, Arkansas Game and Fish, Arkansas Farm Bureau and numerous ATV dealerships.

ExCEL Leadership and Teambuilding - The ExCEL program, an outdoor adventure and leadership program, is the state's largest and most experienced challenge course. More than 2933 youth and adults and 105 groups completed the ExCEL program during the past fiscal year. ExCEL uses dynamic outdoor activities to translate leadership skills immediately into real life situations. Participants are guided through the program by Division of Agriculture educators experienced in working with youths and adults. In addition to increasing participation in the program, ExCEL was voted "Best Teambuilding in Arkansas" by the readers of Arkansas Business as part of the publication's annual Best in Business survey.

Responsible Environmental Stewardship-Quest (RES-Q) and Science Enrichment Education for Kids (SEEK) - During the 2008-2009 fiscal year these Division programs had more than 5,500 participants. Through hands-on activities, these participants were introduced to the 4-H Leadership Life Skills as interpreted through our mission: Learning about the natural world, communication through teamwork, conservation of our natural resources, exploring relationships to and within nature,

understanding self, and decision making particularly with regard to understanding the environmental impact of our choices. During this time the RES-Q program's name was changed to "Arkansas Outdoor School" in order to expand programming and serve a broader audience. SEEK is a hands-on outdoor education program designed to meet the science needs of homeschooled children. SEEK was again selected as a National Program of Distinction.

Teaching the Foresters of Tomorrow - The foresters of tomorrow may well have been members of one of the nearly 900 4-H clubs in Arkansas. The Division of Agriculture encourages forestry education in 4-H by sponsoring a forestry contest that culminates with the winning state team participating in the National 4-H Forestry Invitational Contest. County extension agents and state personnel have developed a forestry CD that makes it easier than ever for young people to study for the contest. User friendly and interactive, the CD makes study more interesting and encourages increased participation. The CD includes everything that a team needs to prepare for the contest, all in one convenient tool. Although this comprehensive CD was developed for the forestry contest, it also is an applicable tool to study the biology and heritability of the genetic trait for glyphosate resistance.

Personal Finance - Many young people are unskilled in managing their personal finances, yet this crucial life skill will greatly affect their future economic well-being. Extension educators help Arkansas' youth understand the basics of money management, and develop sound financial habits to expand their opportunities for the rest of their lives. Youth financial literacy programs not only help young people increase their understanding of money management, but also improve their financial behavior in the ensuing years. Through active, hands-on financial education programs, participants experience "real-world" issues and learn basic financial survival principles involved with earning, spending, saving and investing. In 2009 agents conducted a variety of Family Resource Management educational programs for nearly 600 Arkansas youth. 550 youth reported increased knowledge of recommended financial management practices. 446 youth reported that they can plan how to use financial resources. Educational methods included classroom sessions, consumer judging, personal finance simulations, and summer camps. In response to a personal finance simulation program, one high school student remarked "It helped me learn how to use money and credit in the future. It was also fun." Another student said, "I feel more prepared for college and the rest of my life."

4-H State Camps - 679 youth and adult volunteers participated in the Arkansas State 4-H Camps. The state camp educational programs included backpacking, entrepreneurship, equine education, and cultural/geography education. Additionally, overnight campers participated in physical outdoor activities, gained independence, learned to better work in a group, and made friends from around the state. In 2009, 95 % of campers, ranging in age from 5 to 12 years old, reported making a new friend at camp.

Community Development - Since it is clear from the rural development research that the traditional manufacturing industries are not likely to improve economic conditions for rural areas, Arkansas' community development programs have focused on building local capacity for social and economic improvement by helping to create economic opportunities and community resiliency to social and economic hardship through education, outreach and technical assistance with four major programming activities: visioning and strategic planning; economic development programming; small business development; and local government educational programs and technical assistance.

Participants in Community and Economic Development programs have learned how to a) build their local capacity for improving social and economic conditions; b) organize to create specific changes in their communities; and c) implement diverse economic development strategies. They have increased their human and social capital through both formal and informal education, and by working with local and state education programs to improve the availability and quality of schooling in their communities. They created new economic opportunities by taking on new and innovative community based projects designed to bring more dollars into their communities (such as county fair activities and multi-county garage sales). They have created significant numbers of new job opportunities by developing new value-added ventures (such as biofuel plants and a new sweet potato storage facility) and direct marketing ventures (farmers markets, fruits and horticultural enterprises). They have enhanced historical, cultural, natural resource based assets and increased agritourism, bringing in more tourism dollars into their communities. Some have taken advantage of new technologies to bring broadband into their communities and others have used broadband to create new e-commerce businesses. They have also improved the quality of their lives, providing new housing, removing derelict housing, beginning new programs for youth and improved the quality and access to health care and other critical services in their communities.

Global Food Security, Climate Change and Sustainable Energy

Center for Agricultural and Rural Sustainability (CARS)- The Division of Agriculture is providing leadership for a sustainable food and agricultural project. The Division of Agriculture's Center for Agricultural and Rural Sustainability (CARS) links research and extension programs to provide leadership in balancing the demands of community, agriculture and

ecosystems to meet the needs of current and future generations.

As part of this work, CARS has initiated a global food security program in partnership with commodity groups, agricultural technology companies, Nongovernmental Organizations including World Wildlife Fund and the Gates Foundation, and international research institutes including the International Water Management Institute. The goal of the program is to explore, understand, and innovate food production systems at all scales (plot to field) to insure production of nutritious, safe, affordable, and profitable food for the next 50 years. This approach will integrate global data on natural resources, global climate change, and agricultural production, post-harvest processing, distribution, and consumption in order to evaluate security and scarcity status by location, region, river basin, nation, and biome. The program consists of several focused projects: Global Crop Water Demand, Global Crop Life Cycle Analysis, and Global Small Landholder Prosperity.

The Global Crop Water Demand project will quantify water demand for crops globally using the DSSAT CERES model and remotely sensed data, linked to yield assessments from the field. The program will quantify green versus blue water resources used for crop production in the US and globally at resolutions ranging from 10 meters squared to 10 kilometers squared, evaluate the yield deficit by region, evaluate water scarcity by region, predict the impact of climate change on yield by region, and evaluate the impact of reduced water demand for crop production. The objective is to evaluate at high geospatial and temporal resolution water resource limitations on crop production, and the implications for global food security. The Global Crop Life Cycle Analysis project will evaluate inputs necessary to produce crops across all regions of Earth, and assess the impacts of those inputs on a suite of criteria, including water use, energy use, community prosperity, biodiversity, land use and greenhouse gas emissions. The Global Small Landholder Prosperity project objective is to understand production and market limitations to prosperous agricultural production for small (<200ha) landowners.

Global Rice Model - Rice is the most trade-distorted crop exported by the US due to protectionist policies of many Asian and European countries. The rice market is particularly unstable because it is subject to 1) the Asian monsoon weather, 2) high levels of trade protection and 3) a high degree of market segmentation based on product differentiation at the production, processing and consumption levels. A team headed by Dr. Eric Wailes has developed the Arkansas Global Rice Model (AGRM). This model generates a 10-year Baseline projection of the global rice market including all major rice producing, consuming and trading nations. The AGRM provides estimates of production, consumption, trade, prices and stocks based on historical supply and demand relationships, policies, and macroeconomic variables such as population and income growth. From this baseline, the model can be used to simulate the impacts of government policies and other "shocks" to the global rice market. During the past year, AGRM was used to evaluate impacts of alternative bio-fuels policies and the role of policy in explaining the extraordinary high price spikes in global rice prices in 2008. The research on the global rice economy and analysis of trade protection has received considerable attention from the World Bank, the United Nations, the U.S. Congress and many policy decision-makers in the U.S. and the rest of the world. The World Bank, OECD, FAO, and the Government of Japan have requested assistance from the Arkansas Global Rice Economics team in developing their rice market analysis.

Applied Research and Field Trials:

Commodity Crop Support. Yields in corn, soybean, and rice verification fields that used UA Division of Agriculture recommendations were compared to state averages. The overall rice yield potential has increased by an average of 83 lbs/acre each year. The contribution of genetic gain to this yield increase is 47 bushels/acre. Considering more than 50% of the rice acreage in Arkansas is planted to cultivars developed by the University of Arkansas Breeding Program, this contribution has resulted in an additional 429 million dollars additional farm income over this 20-year period. Four new cultivars were released in 2009 by the University of Arkansas that is anticipated will continue the major impact on the rice industry in the Southern USA. 'CL 142 AR' and 'CL 181 AR' appear to provide an additional 4% in yield potential compared to similar cultivars. It is also expected that 'CL 142 AR' may be produced on as much as 25% of the acreage in 2011. Data on shifts in production technology, acreage, cropping systems, and enrollment were compared to historic levels and trends. The data shows that the yield levels of these crops increased.

Applied research and field trials conducted by Division of Agriculture Poultry faculty identified unsuitable energy technologies as well as problems with drinking water treatment, litter processing and feed delivery technologies. Information gained from applied research and field trials was shared with allied industry representatives through a variety of delivery methods. Observations indicated increased knowledge of drinking water treatment and litter processing technologies. In addition, technology adoption rates were estimated at 15%, resulting savings of approximately \$6.3 million.

Allied Poultry Industry Support. Poultry related jobs accounted for nearly \$3 billion in labor income in Arkansas or \$1 out of every \$4 in agricultural labor income. The over \$3.3 billion in cash receipts from the poultry industry amounted to 46.2% of all agricultural cash receipts. In addition, the poultry industry contributed over \$2.6 billion in value added to the Arkansas

economy. Yet owners of the 5640 poultry farms struggle to maintain competitive production efficiencies via new technology adoption. Applied research and field trials conducted by Extension Poultry faculty identified unsuitable energy technologies as well as problems with drinking water treatment, litter processing and feed delivery technologies. Information gained from applied research and field trials was shared with vertically integrated companies, allied industry representatives and production personnel via trade publications, workshop, one-on-one consultations, newsletters and CES publications. Informal observations indicated increase knowledge of drinking water treatment and litter processing technologies. In addition, technology adoption rates were estimated at 15%, resulting savings of approximately \$6.3 million.

Ground Water - Ground water use from the alluvial aquifer in Arkansas is considered to be unsustainable since water use exceeds recharge. If in the future water use is restricted in the Delta, could producers make money by switching from traditional crops to bioenergy crops, how does that change cropping patterns? A model was developed to explore how producers might alter their cropping decisions if water pumping in the Delta was restricted to "sustainable" levels, and, at the same time, markets were developed for bioenergy crops such as switchgrass and forage sorghum. Initial research with the model looked at two water scenarios: (1) full sustainability of the aquifer; and (2) restricting irrigation to a lesser extent than full sustainability to extend the life of the aquifer. Both scenarios were modeled with and without the addition of less water-intensive bioenergy crops at various price levels. If water use is restricted, agricultural income declines in Delta counties. However, the introduction of biomass crops at prices between \$50 and \$55 per dry ton would at least partially negate these economic losses regionally and completely for the entire state. In other words, spatial agricultural income redistribution is inevitable but much less drastic with the introduction of biomass crops than without. The results suggest that farmers need to look to non-groundwater based sources of irrigation water by either using irrigation water more efficiently and/or utilizing man made irrigation storage alternatives.

Water Management - A Southern Regional water research project was undertaken by six states to determine what measures are being taken by water districts and municipalities to conserve water during periods of drought. The goal of the study was to determine techniques used when water supplies reached severe declines. The information from this study would be shared with water managers for use in implementing new methods of water conservation measures when necessary. A summary of project recommended water conservation measures will be shared with water managers. The information will be a valuable tool for use by water managers in implementing new and innovative water conservation measures in their municipalities and water districts. The information can also be shared with water managers in other parts of the country as appropriate. Water managers will have more tools to use and can time when tools are needed when water conservation becomes necessary. Managers will also have new ideas available to educate the public on installing devices to save water and lower water bills.

Public Policy Analysis: Carbon Emissions - Congress is considering several bills designed to slow down climate change by either taxing carbon emissions or imposing a cap-and-trade system. Since little research has been conducted on the possible impacts of these proposed policies on the agricultural sector in the US and in Arkansas, a model was constructed to estimate the impact of various carbon policies on agricultural producers in Arkansas. This model can estimate changes in cropping allocations as well as changes in producer revenue on a county level under different policy scenarios. The emissions portion of the model gives policy makers estimates of the impacts of various carbon/GHG (green house gas) policies on Arkansas producers. The estimates also give commodity groups an idea of where they stand in terms of GHG emissions in comparisons to alternative crops. The sequestration portion of the model sets forth a new methodology for measuring carbon emissions as well as providing policy makers the implications of carbon offset (sequestration) market. The estimates also provide policy makers a snapshot of how various carbon offset prices will affect cropping patterns and resulting input and output prices.

Alternative Fuels - The 2008 Farm Bill contained several renewable energy programs that provided grants and/or loans to groups, individuals, government entities, organizations, etc. to develop renewable energy projects. Scientists reviewed the renewable energy programs contained in the Farm Bill and published pertinent information in a fact sheet. The fact sheet identified the programs, the funding agency, application process, funding available, and the contact information. The fact sheet was utilized statewide by Extension agents to answer clientele farm bill energy related questions and as a valuable resource and quick reference guide for consultation on energy programs. The fact sheet has also been utilized by Extension partners and collaborators who work with clientele that have interest in the energy programs.

Food Security for Vulnerable Populations: Supplemental Nutrition Assistance Program- Education (SNAP-Ed)- As a result of the economic downturn, the number of Arkansans receiving SNAP benefits increased 10% in 2009. The SNAP-Ed program teaches people who are eligible for SNAP benefits to make healthy food choices while making the most of their food dollars. In FY09, Arkansas SNAP-Ed reached over 11,000 adults. As a result of participation in the program, 59 percent of adults surveyed said they made one or more positive dietary change, 60 percent increased physical activity by at least thirty minutes a week and 54 percent said they used nutrition labels more often to make healthy food choices.

SNAP-Ed is also collaborating with schools to provide nutrition education to children in schools where at least 50 percent of students qualify for free and reduced-price lunch. In 2009, SNAP-Ed delivered nutrition education to 182 schools, reaching more than 266,000 youth. Eighty-three percent of those surveyed increased their knowledge concerning one or more healthy food/nutrition practice, 75 percent said they intended to adopt one or more healthy nutrition practice and 57 percent increased physical activity by at least thirty minutes per week.

Expanded Food and Nutrition Education Program - The Expanded Food and Nutrition Education Program of the Division of Agriculture is an eight-session program focusing on healthy lifestyle changes by low income families. Its mission is to help families with limited incomes acquire knowledge, skills, attitudes and behavior changes necessary to maintain nutritionally sound diets and enhance personal development. Thirteen counties conducted EFNEP and enrolled 2,741 participants that included 9,107 family members. At the end of the program, more than 1,420 participants graduated from the program. One graduate reported she was eating less fried foods and junk foods and more fruits and vegetables. for Agriculture - Extension for Agriculture &ndash Research

The 2008-2009 CSREES Report of Accomplishments provides a comprehensive accounting of the University of Arkansas Division of Agriculture's annual accomplishments. For the purpose of this report, the accomplishments of the University of Arkansas Division of Agriculture have been summarized through fifteen planned program areas which include: Agricultural and Food Biosecurity; Agricultural Systems; Animals and Animal Products; Economic and Commerce; Families, Youth and Communities; Food, Nutrition and Health; Natural Resources and Environment; Pest Management; Plant and Plant Products; Technology and Engineering; Global Food Security and Hunger; Childhood Obesity; Food Safety; Sustainable Energy; and Climate Change.

The Division's administration and faculty have committed time and resources from federal, state, county, city, and private sources to address diverse and complex priority issues for Arkansas and our federal partners. Through our comprehensive research and Extension programs, 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,

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Total Actual Amount of professional FTEs/SYs for this State

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	452.8	0.0	121.7	0.0
Actual	395.2	0.0	122.2	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 were derived from both formal and informal means for all program areas. Public comment on current and future extension and research programs was obtained from county and community meetings, commodity and community associations, commodity check-off boards, state legislative committees and open public forums concerning specific issues. Open public meetings, field days and county and regional production meetings provided forums for stakeholder input open to under-served or under-represented individuals, groups or organizations. For extension, county councils and advisory groups met during the summer of 2009 (at a minimum) to provide input, feedback and/or review of program implementation, redirection, or newly identified needs. Members of these groups were invited to participate in programs, field days, special tours, workshops and conferences throughout the year and for the duration of the program. All reviews of research and extension programs included a stakeholder member or members of the community or industry most influenced by the program area. Open public forums were held to address specific issues of importance to the stakeholder community or industry.

Administrative Approval and Review

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

External Review

Merit review is conducted as part of Division of Agriculture's on-going program review process. The reviews have been departmental or programmatic and cut across departments. Reviews are scheduled on a five to seven year cycle and conducted concurrently for research, extension and instruction. All reviews have been conducted by a team of recognized outside research, extension and teaching professionals balanced to reflect the programmatic needs and diversity. All reviews include one or more stakeholders. The actual review process involves a period of self study, followed by program assessment and bench marking. The review team evaluates the programs' effectiveness relative to the stated mission and goals of the department or program as well as the need of stakeholders. Following the outside review teams' written evaluation, the department or program prepared a response to the review. The Division of Agriculture and University administration then met with the department or program faculty one more time to develop a plan for implementing changes. Thereafter, annual progress was reported to Division and University administration. The Rice Breeding program went through a formal program review in 2009.

III. Stakeholder Input

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

- Use of media to announce public meetings and listening sessions
- Targeted invitation to traditional stakeholder groups
- Targeted invitation to non-traditional stakeholder groups
- Targeted invitation to selected individuals from general public
- Survey of traditional stakeholder groups

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

Brief explanation.

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

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

1. Method to identify individuals and groups

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

Brief explanation.

In 2009 the University of Arkansas Division of Agriculture sought input from diverse stakeholder groups. Stakeholders serve on county councils, advisory committees, and boards that advise and oversee the work of the Division. Individuals and stakeholder groups were identified by Arkansas Experiment Station faculty and administrators and by asking county Extension staffs to identify individuals in their local communities who were representative of one or more of the following fifteen stakeholder categories: county services (e.g., DHS, Food Bank or Pantry); financial sector (e.g., banks, agricultural lending, investments); faith-based sector (e.g., church, youth minister); education (public, private, vocational); commercial sector (e.g., chambers of commerce, industry); health (e.g., hospital, public health, doctor); agricultural production; agricultural businesses; county Extension council; 4-H program (e.g., leader, teen, alumni, foundation); government official (e.g., county, city); Extension homemaker; natural resources (e.g., wildlife, forestry, conservation); media (e.g., radio, newspaper, television); and youth services (e.g., community center, youth organizations). In addition to these criteria, Extension staffs were also asked to identify individuals within the fifteen categories who were representative of the gender, racial, ethnic, and socioeconomic demographic make-up of the counties.

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

1. Methods for collecting Stakeholder Input

- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting with the general public (open meeting advertised to all)
- Survey of the general public
- Meeting specifically with non-traditional groups
- Meeting specifically with non-traditional individuals

- Meeting with invited selected individuals from the general public
- Survey of selected individuals from the general public
- Other (Meeting with regulatory groups, state agencies, & commodity prom)

Brief explanation.

During the summer of 2009, extension faculty met with county council members and program sub-committees to identify local needs for the program planning year beginning October first. County profiles developed by state faculty were utilized to examine a diversity of needs and to understand the changing demographics within each county. Stakeholder-developed materials, such as the Farm Bureau policy development process were used to identify research needs. Several priority-setting activities were scheduled during 2009 with specific commodity or stakeholder groups to seek input on the research planning process.

By talking with stakeholders and listening to their thoughts and suggestions for the direction of the Division, we have been able to outline our strategy for the past five years. Plans began in the summer of 2009 for the engagement of stakeholders for the creation of the 2011-2015 Division of Agriculture Strategic Plan. This planning process has a goal of broad engagement. Web-based surveys will be utilized to provide the opportunity for diverse stakeholder input from all 75 counties. Stakeholders without internet access or who need other accommodations will be provided with alternative input options. In addition, a day-long "listening session" is scheduled in May 2010 to engage 50-60 policy makers and key community and state organizational leaders to help consider critical and emerging needs within our state, and the role of the Division in addressing those needs. Focus groups are also planned to ensure input from underserved and underrepresented groups.

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 involved in identification of research needs and priorities.

During the statewide listening sessions in support of our last five year plan, over 650 Arkansans 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. Concerns were voiced by local officials, legislators and agricultural producers. Comments also came from educators, community leaders and health professionals.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
5591486	0	3726001	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	6881973	0	3726001	0
Actual Matching	5591486	0	3823590	0
Actual All Other	39707089	0	54018305	0
Total Actual Expended	52180548	0	61567896	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from				
Carryover	3177456	0	0	0

V. Planned Program Table of Content

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

V(A). Planned Program (Summary)**Program # 1****1. Name of the Planned Program**

Agricultural & Food Biosecurity

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
211	Insects, Mites, and Other Arthropods Affecting Plants	10%		10%	
212	Pathogens and Nematodes Affecting Plants	15%		15%	
213	Weeds Affecting Plants	10%		10%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		5%	
311	Animal Diseases	20%		20%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	5%		5%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	20%		20%	
722	Zoonotic Diseases and Parasites Affecting Humans	15%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	2.6	0.0	3.2	0.0
Actual	6.1	0.0	1.1	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
105295	0	11715	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
85550	0	12022	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
607518	0	569663	0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

Individual consultations and interviews
 Workshops/Conferences/Trainings
 Farm visits
 Field Days
 Surveillance and Monitoring
 Education materials
 Mass Media (print, radio, TV)
 Newsletters & Direct Mailing
 Collaboration with state/federal agencies and regulatory officials

2. Brief description of the target audience

Row crop producers
 Crop consultants
 Dealer personnel
 Pesticide applicators
 Poultry Company Personnel
 Livestock and Poultry Producers
 Local/State/Federal Personnel
 First Responders
 Food Processing Personnel
 Agribusiness
 Home Owners/Consumers
 Division of Agriculture personnel

V(E). Planned Program (Outputs)**1. Standard output measures**

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	10000	20000	120	0
Actual	27824	17976	106	3

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

Year: 2009
 Plan: 3
 Actual: 0

Patents listed

1. Targeting motility properties of bacteria in the development of therapeutic and prophylactic competitive exclusion cultures against *Campylobacter* and other food borne pathogens.
2. Novel use for existing technology designed to remove pathogens from biological samples incorporating the use of bacteriophages to these procedures, with the objective of reducing transmissible bacterial pathogens from semen.
3. Novel use for existing technology designed to remove pathogens from biological samples incorporating natural compounds to these procedures with the objective of reducing transmissible pathogens from semen.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	20	20	
Actual	2	58	60

V(F). State Defined Outputs**Output Target****Output #1****Output Measure**

- # of clientele trained on Agricultural and Food Biosecurity

Year	Target	Actual
2009	10000	2121

Output #2**Output Measure**

- # of educational materials developed on Agricultural and Food Biosecurity

Year	Target	Actual
2009	10	43

Output #3**Output Measure**

- # of newsletters & fact sheets disseminated to clientele regarding Agricultural and Food Biosecurity

Year	Target	Actual
2009	10000	7762

Output #4**Output Measure**

- # of clientele interviewed/surveyed on Agricultural and Food Biosecurity

Year	Target	Actual
2009	100	25

Output #5**Output Measure**

- # of requested consultations related to exotic animal disease concerns

Year	Target	Actual
2009	250	300

Output #6**Output Measure**

- # of hits to CES website regarding avian biosecurity

Year	Target	Actual
2009	4400	9682

Output #7**Output Measure**

- # of hits to CES website regarding livestock biosecurity

Year	Target	Actual
2009	14000	14535

Output #8**Output Measure**

- # of plant sites surveyed monitored

Year	Target	Actual
2009	30	28

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

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

Outcome #1**1. Outcome Measures**

of growers/producers reporting knowledge gained or increased awareness of need for biosecurity

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	150	357

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Soybean rust continues to be a potential biosecurity threat to Arkansas. Each year spores move northward into the soybean production states, and Arkansas with 3.4 million acres planted remains a keystone region for disease development and further advancement toward the Midwest. With no resistance to the disease, it is imperative that geographic development of soybean rust over time be monitored so growers can protect their crops, or avoid unnecessary fungicide applications if not warranted.

What has been done

With support from the Arkansas Soybean Promotion Board, the United Soybean Board, and the North Central Soybean Research Program, Division of Agriculture plant pathologists monitored 28 sentinel plots, various kudzu locations and cooperating grower fields during 2009 for the disease. When found, an awareness and information campaign was implemented to warn growers and provide them with the knowledge to make informed control decisions statewide.

Results

Soybean rust was first detected in August 10 in southeast Arkansas and by September 30 (50 days) was confirmed in every soybean production county in the state. Growers were made aware using an electronic newsletter distributed weekly or bi-weekly to 750 first detectors across the state and from them to the more than 6500 soybean producers in Arkansas. Informal surveys of first detectors during the epidemic suggested that all growers had become aware of the development of rust in their areas, and at what level. In addition, first detectors were satisfied that producers gained effective knowledge from the newsletters to make informed fungicide decisions on 1.1 million acres, saving applications on 500,000. In general, satisfaction with the program was very high statewide, and growers have indicated continuing support for the soybean rust monitoring program in Arkansas for 2010.

4. Associated Knowledge Areas

KA Code Knowledge Area

211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
311	Animal Diseases
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #2

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	Quantitative Target	Actual
2009	150	358

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The total farm value of livestock, poultry and crops in Arkansas is over 8 billion dollars with poultry a major agricultural product. Exotic disease outbreaks in Arkansas or in the United States could result in a quarantine of poultry and poultry products severely impacting the economy of the state and individual growers/producers in particular.

What has been done

Biosecurity and early disease recognition continue to be the mainstay for prevention and control of disease. Biosecurity enhancement measures were communicated to growers/producers through formal presentations and publications. In addition, county agents received information that was distributed to hobby farm owners to ensure Biosecurity in their flocks. The continued improvement of Biosecurity protocols allows for better disease protection of a flock by reducing the exposure risk.

Results

Prevention and/or reduction in the incidence of disease can result in savings of millions of dollars. This vigilance and implementation of Biosecurity protocols by growers/producers further enhances the efforts to prevent diseases such as "bird flu" or H1N1 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 #3**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	Quantitative Target	Actual
2009	100	160

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Poultry is a major agricultural product in Arkansas and is valued at close to 3 billion dollars. Mortality figures associated with broilers, turkeys, and layers, are 4%, 8%, and 16% respectively over the life of the flock with infectious diseases a major cause of the mortality and responsible for an additional 1+% loss in condemnations. Exotic disease outbreaks in Arkansas or in the United States could result in a quarantine of poultry and poultry products severely impacting the economy of the state.

What has been done

The continued threat of Agroterrorism against the United States animal population is such that vigilance is needed to prevent the use of infectious diseases as a weapon against the United States food supply. The impact of an Agroterrorism attack against the US food supply would cause a devastating effect on product exportation and losses of markets which could be irreparable.

Results

The loss of confidence in the safety of the US food supply could be incalculable. Informal surveys indicate that growers/producers in Arkansas have implemented procedures and practices to increase Biosecurity to decrease the risk of disease introduction or spread. The continued concern over H1N1 (Swine Flu) and H5N1 (Bird Flu) reinforces the continued need for Biosecurity practices to prevent disease. The control of diseases is greatly enhanced as growers/producers continue to improve their Biosecurity practices.

4. Associated Knowledge Areas

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

213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
311	Animal Diseases
722	Zoonotic Diseases and Parasites Affecting Humans

Outcome #4**1. Outcome Measures**

of diagnostic invasive plant pest samples

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2000	2944

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Monitoring of crops for potential biosecurity pathogens remains a systematic and sustained challenge for Arkansas production. Introductions of new pathogens, or the evolution of new strains from existing populations, continue to be a potential threat to sustainable food production in the U.S. A single, new disease can result in millions of lost dollars in additional control costs, on top of new investments in research and education to modify management systems.

What has been done

With support from the University of Arkansas Division of Agriculture, and the Southern Pest Detection Network (SPDN) project funded by USDA/CSREES and led by the University of Florida Department of Plant Pathology, we upgraded and/or relocated monitoring and diagnostic systems in Arkansas during 2009. Network labs are located in Southwest Arkansas, East Central Arkansas, and in Fayetteville. County extension agents, consultants and other personnel are trained annually in crop monitoring and diagnosis for more effective statewide coverage.

Results

The Nematode Diagnostic Laboratory processed over 3500 soil samples and monitored area rice samples for the white tip nematode. The Plant Health Clinic Triage Laboratory processed 991 soybean rust samples, and received and inspected other crop samples to better monitor the millions of acres of important crops in this region. The primary Plant Health Clinic was relocated to the University of Arkansas campus to better serve the region in plant diagnostics. While it processed more than 2900 plant samples, the need for more sensitive and sophisticated diagnostic technology led to relocation to a more suitable site. The new facility will offer PCR diagnostics in 2010, in addition to upgraded ELISA testing and DIC computer assisted microscopy.

4. Associated Knowledge Areas

KA Code	Knowledge Area
211	Insects, Mites, and Other Arthropods Affecting Plants
212	Pathogens and Nematodes Affecting Plants
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants

Outcome #5

1. Outcome Measures

of diagnostic invasive nematode samples

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	5000	3893

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Soybean Cyst Nematode (SCN) remains one of the most important and evolving crop threats in the United States. While not a new problem, its ability to adapt to resistant soybean cultivars makes it an ongoing production risk that has been very difficult to control. In Arkansas, despite irrigations, rotation, resistant cultivars and other management practices, SCN cost producers an estimated 10.9 million dollars in lost yield.

What has been done

The sustainability of soybean production is a complicated challenge, with many disease threats, including nematodes, posing continuous and evolving enemies. With support from the Arkansas Soybean Promotion Board, University of Arkansas Division of Agriculture nematologists monitored SCN in soil samples and assessed race structure of the changing SCN population against different soybean cultivars. Monitoring was conducted at the Southwest Research and Extension Center near Hope, AR and the Arkansas Agricultural Research and Extension Center in Fayetteville.

Results

Of the more than 3500 samples processed by the Nematode Diagnostic Laboratory during 2009, approximately 1000 were representative samples for SCN analysis. About 20 years ago, more than 90% of soybean soil samples from Arkansas contained Race 3 SCN, and almost all soybean cultivars the past two decades were resistant to this race. In 2009, 0 samples contained Race 3, 70% of samples were Race 2, 20% were Race 5,

and the remaining 10% were Races 9, 14 or undetermined. With regard to resistance in 2009 soybean cultivars, less than 4 commercial cultivars of 300 tested had resistance to Races 2 or 5. The ongoing evolution of the SCN population in Arkansas, in response to the widespread use of limited and specific resistance genes in the past, poses a major sustainability challenge to soybean production in the state and region.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

Outcome #6

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	17000	308024

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The value of the United States animal agriculture production is approximately 14% of the gross domestic product and represents approximately 19% of all employment with almost 1 million jobs. Exports represent roughly 20% of all animal production and over 140 billion dollars. Poultry, a major agricultural product in Arkansas, is valued at close to 3 billion dollars and represents a significant part of the state economy.

What has been done

New and continued foreign animal disease threats, the continued threat of Agroterrorism, and the concern over a possible pandemic Influenza outbreak (H1N1 and H5N1) have necessitated increased awareness of diseases and efforts to monitor for and prevent them. Poultry integrators continue routine Avian Influenza serological monitoring/surveillance efforts on all flocks of poultry as part of the National Poultry Improvement Plan. Hobby flock owners were contacted and information provided as to where testing is available for their flocks.

Results

Commercial poultry growers and backyard hobby flock owners, due to increased awareness as a result of educational efforts, are more aware of testing programs and diagnostic laboratory assistance for disease determination and control. They recognize that the surveillance testing and diagnostic assistance are an integral

part of the Biosecurity effort to reduce the risk of disease introduction and/or spread and protect the US food supply.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

of Asian Soybean Rust positive samples

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1000	991

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Soybean rust continues to be a potential biosecurity threat to Arkansas. Depending on temperatures and weather fronts, spores move northward and Arkansas with 3.4 million acres planted remains a keystone region for disease development and further advancement toward the Midwest. With no resistance to the disease in soybeans grown here, it is imperative that geographic development of soybean rust over time be monitored so growers can protect their crops or avoid unnecessary fungicide applications if not warranted.

What has been done

With support from the Arkansas Soybean Promotion Board, the United Soybean Board, and the North Central Soybean Research Program, Division of Agriculture plant pathologists monitored 28 sentinel plots, various kudzu locations and cooperating grower fields during 2009 for the disease. Progress of the disease over time was issued primarily by electronic newsletter and cell phone calls.

Results

Soybean rust was first detected in August 10 and by September 30 (50 days) a total of 991 samples confirmed the disease in every soybean production county in the state. Since the soybean crop was planted late in 2009 due to untimely spring rains, approximately 1.1 million acres were still in risky growth stages by early September.

In September, conditions were near ideal for rapid disease development, while in others regions disease progress was very slow. The monitoring program provided these growers information for effective fungicide decision-making, depending on their location and potential for damage, and growers responded by spraying 600,000 acres but did not spray the remaining 500,000. This program resulted in an estimated \$9,000,000 savings in yield protection and/or avoiding unneeded applications.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

Outcome #8

1. Outcome Measures

of SOD positive samples

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	5	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
 There were no SOD positive samples.

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants

Outcome #9

1. Outcome Measures

of plant pests (other) positive samples

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	20	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

There were no other plant pest positive samples.

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
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Excellent awareness and monitoring reduced any impact from soybean rust sample outcomes. High input costs (feed, fuel and fertilizer) could have caused a compromised of biosecurity practices. Reduced confidence regarding the economy may have impacted consumer food biosecurity concerns. We had limited effectiveness because of neither static nor non-increasing resources. Growing number of backyard hobby flocks due to cultural changes have increased.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Other (Use of Secondary Data)

Evaluation Results

Arkansas' plant and animal biosecurity efforts were largely successful as reflected in the number of pathogens/nematodes positive samples, low number of grower referrals to diagnostic labs for disease testing, no reported livestock or poultry exotic diseases.

Key Items of Evaluation

Secondary evidence based data collected through diagnostic labs.

V(A). Planned Program (Summary)**Program # 2****1. Name of the Planned Program**

Agricultural Systems

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
112	Watershed Protection and Management	5%		5%	
131	Alternative Uses of Land	5%		5%	
133	Pollution Prevention and Mitigation	5%		5%	
134	Outdoor Recreation	10%		10%	
204	Plant Product Quality and Utility (Preharvest)	5%		5%	
205	Plant Management Systems	5%		5%	
216	Integrated Pest Management Systems	10%		10%	
307	Animal Management Systems	5%		5%	
401	Structures, Facilities, and General Purpose Farm Supplies	5%		5%	
403	Waste Disposal, Recycling, and Reuse	5%		5%	
601	Economics of Agricultural Production and Farm Management	5%		5%	
602	Business Management, Finance, and Taxation	5%		5%	
604	Marketing and Distribution Practices	10%		10%	
605	Natural Resource and Environmental Economics	5%		5%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	6.0	0.0	1.8	0.0
Actual	1.9	0.0	0.5	0.0

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

Extension		Research	
Smith-Lever 3b & 3c 32345	1890 Extension 0	Hatch 49106	Evans-Allen 0
1862 Matching 26280	1890 Matching 0	1862 Matching 50392	1890 Matching 0
1862 All Other 186623	1890 All Other 0	1862 All Other 35237	1890 All Other 0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

A broad range of direct and indirect methods will be used to provide information to both groups and individuals:

Educational meetings

Tours

Field days

Workshops

One-on-one consultations including farm visits and telephone responses

Articles, newsletters and media interviews in publications targeting agricultural producers and private landowners

Demonstrations

Web-based information

Publications/fact sheet

2. Brief description of the target audience

Agricultural producers

Consultants/certifiers

Non-farm private landowners

Governmental Agency Personnel

Sales & service providers

General public

V(E). Planned Program (Outputs)**1. Standard output measures**

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	15000	7000	1000	300
Actual	5059	530	612	0

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

Year: 2009

Plan: 0

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	2	1	
Actual	2	1	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Target	Actual
2009	7000	1415

Output #2

Output Measure

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

Year	Target	Actual
2009	65	57

Output #3

Output Measure

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

Year	Target	Actual
2009	2	6

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

O. No.	OUTCOME NAME
1	# of clientele who reported knowledge gained
2	Value of alternative agricultural products sold (\$1000)
3	Acres of alternative crops planted.
4	# of clientele who initiated an alternative enterprise, as self reported
5	# of farms selling alternative agricultural products or services, such as farmer markets and wildlife enterprises
6	Change in knowledge

Outcome #1**1. Outcome Measures**

of clientele who reported knowledge gained

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	250	145

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

Outcome #2

1. Outcome Measures

Value of alternative agricultural products sold (\$1000)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	20000	5000

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
604	Marketing and Distribution Practices

Outcome #3

1. Outcome Measures

Acres of alternative crops planted.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	6000	82

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
131	Alternative Uses of Land
133	Pollution Prevention and Mitigation
134	Outdoor Recreation
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
216	Integrated Pest Management Systems
307	Animal Management Systems
401	Structures, Facilities, and General Purpose Farm Supplies
403	Waste Disposal, Recycling, and Reuse
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
604	Marketing and Distribution Practices

Outcome #4**1. Outcome Measures**

of clientele who initiated an alternative enterprise, as self reported

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	25	20

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

Outcome #5

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	250	22

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
604	Marketing and Distribution Practices
605	Natural Resource and Environmental Economics
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources

Outcome #6**1. Outcome Measures**

Change in knowledge

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Improved blackberry varieties along with improved postharvest handling have led to a substantial increase in blackberry marketing in the US and worldwide. Once a fruit picked only in the wild, US retail grocery stores maintain blackberries on shelves year around with a mix of domestic and imported production. Additionally, enhanced quality and flavor along with an interest in healthy foods have helped expand this market. New breeding and genetic improvements have helped feed this demand and are benefitting both growers and consumers of this high-value, high-health berry.

What has been done

The University of Arkansas fruit breeding program has been working with blackberries since 1964 with major goals such as enhanced quality, large fruit size, thornless plants, and more recently the unique primocane-fruiting trait. A series of thornless, floricane-fruiting blackberry varieties has been released including Navaho, Apache, Arapaho, Ouachita, and most recently Natchez. These varieties have been grown in Arkansas, across the south, and from east to west coasts of the nation. The first primocane-fruiting varieties were released in 2004, Prime-Jan(r) and Prime-Jim(r), both intended for the home-garden market. A breakthrough occurred in 2009 with the release of the first shipping-quality primocane-fruiting blackberry Prime-Ark(r) 45. This new variety provides the basis for further

expansion of the fresh-market blackberry industry particularly in the valuable late summer to fall fruiting season where few blackberry varieties exist that ripen late in the year.

Results

Since the winter of 2006-2007, approximately 2.5 million of the University of Arkansas-developed blackberry varieties have been sold in the nursery market, providing for an expansion of potentially 2000 acres of new production. The largest seller, Ouachita, has proven to be a reliable producer of excellent quality in numerous states. Likewise, Navaho, Apache, and Natchez have made substantial headway in new plantings. The release of Prime-Ark(r) 45 will further expand production to bridge the gap between later-season US production and the beginning of substantial importation of blackberries from Mexico in November. Specialty crop grower profits, consumer needs, and overall enhanced nutrition are all being served by these genetic advances.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

The External factors from 2009 was the record rain fall which resulted in crop loss of \$379 million. The slowing of the economy also effected all agriculture.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)**Program # 3****1. Name of the Planned Program**

Animals & Animal Products

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
135	Aquatic and Terrestrial Wildlife	6%		0%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	6%		0%	
204	Plant Product Quality and Utility (Preharvest)	6%		0%	
205	Plant Management Systems	6%		0%	
206	Basic Plant Biology	6%		0%	
301	Reproductive Performance of Animals	6%		0%	
302	Nutrient Utilization in Animals	6%		0%	
303	Genetic Improvement of Animals	6%		0%	
304	Animal Genome	6%		0%	
305	Animal Physiological Processes	6%		0%	
306	Environmental Stress in Animals	6%		0%	
307	Animal Management Systems	6%		0%	
308	Improved Animal Products (Before Harvest)	6%		0%	
311	Animal Diseases	6%		0%	
315	Animal Welfare/Well-Being and Protection	6%		0%	
601	Economics of Agricultural Production and Farm Management	10%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	21.6	0.0	20.4	0.0
Actual	1.2	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 20646	1890 Extension 0	Hatch 0	Evans-Allen 0
1862 Matching 16774	1890 Matching 0	1862 Matching 0	1890 Matching 0
1862 All Other 119121	1890 All Other 0	1862 All Other 0	1890 All Other 0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

Conduct educational meetings, workshops, farm visits to educate agricultural producers
 Conduct tours, field days, and demonstrations
 Conduct one-on-one consultations
 Publish educational materials
 Conduct mass media efforts (radio, TV, etc.)
 Conduct train-the-trainer education
 Partner with industry (when appropriate)
 Design and conduct practical and applied research to improve the efficiency of growth, reproduction, health and management of livestock, forages, aquaculture, and poultry

2. Brief description of the target audience

Agricultural producers
 Non-farm private landowners
 Aquaculture producers
 Small pond owners
 Agricultural businesses/allied industry personnel
 Consultants
 Breeder managers
 Hatchery managers
 Commercial poultry producers
 Commercial poultry companies
 Other researchers
 Students
 Extension specialists
 Teaching faculty
 Research funding personnel and agencies
 Policy and decision makers
 Public

V(E). Planned Program (Outputs)**1. Standard output measures**

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	46800	50000	0	0
Actual	34608	159575	2234	1765

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

Year: 2009

Plan: 8

Actual: 1

Patents listed

Lactic acid bacteria and their use in swine direct-fed microbials

3. Publications (Standard General Output Measure)**Number of Peer Reviewed Publications**

2009	Extension	Research	Total
Plan	13	125	
Actual	15	91	106

V(F). State Defined Outputs**Output Target****Output #1****Output Measure**

- Number of educational programs, workshops, educational meeting and/or field days
Not reporting on this Output for this Annual Report

Output #2**Output Measure**

- Number of clientele attending educational programs (field days, workshops, etc.)
Not reporting on this Output for this Annual Report

Output #3**Output Measure**

- Number of producers receiving educational material (newsletters, fact sheets, etc)
Not reporting on this Output for this Annual Report

Output #4**Output Measure**

- Number of producers conducting on farm demonstrations
Not reporting on this Output for this Annual Report

Output #5**Output Measure**

- Number of farm visits or one-on-one consultations with producers
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	Number of business start ups related to animal and animal products
2	Number of livestock producers who increased knowledge or gained awareness related to livestock production management practices
3	Number of livestock producers who adopted a new practice
4	Number of livestock producers who initiated or improved their record keeping
5	Number of poultry producers who adopted new practices or technology
6	Number of allied poultry industry personnel who adopt new practices or technology
7	Number of livestock producers who changed a management practice
8	Arkansas cash receipts from farm marketing (\$1,000) related to aquaculture enterprises.
9	Number of clientele who reported knowledge gained related to aquaculture.
10	Number of clientele who adopted new aquaculture practices.

Outcome #1

1. Outcome Measures

Number of business start ups related to animal and animal products

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Number of livestock producers who adopted a new practice

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of livestock producers who initiated or improved their record keeping

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of poultry producers who adopted new practices or technology

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Number of livestock producers who changed a management practice

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Arkansas cash receipts from farm marketing (\$1,000) related to aquaculture enterprises.

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Number of clientele who reported knowledge gained related to aquaculture.

Not Reporting on this Outcome Measure

Outcome #10

1. Outcome Measures

Number of clientele who adopted new aquaculture practices.

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 in 2009 included the soaring costs of feed for livestock and poultry. This was caused by public policy mandating and subsidizing conversion of corn to ethanol. Impacts of poultry and livestock were direct, namely increased costs of production. Cattle producers felt the direct increased costs of

supplemental feed for grazing cattle and also the reduced prices for their products – stocker and feeder calves. Ironically, greatly increased costs of feedlot production increased the value of weight gain on grass and created the opportunity for improved profits by growing calves to heavier market weights on forages. In terms of rainfall, 2009 was a record year. For most of the state, rainfall exceeded the average rainfall by 30 to 50 inches. This impacted timely application of fertilizer and the ability to produce high quality hay. Many cattle producers lost an entire hay crop due to excessive rainfall. Many pastures or hay meadows flooded many times throughout the year resulting in weakened grass stands and opportunity for weed encroachment. The nation's economy pressured demand for meat, especially at the restaurant level as consumer had less disposable income for luxury expenditures. Diversion of grain to ethanol forced Arkansas cattlemen to utilize more by-product feeds instead of corn to supplement their cow herd. Soaring costs for fuel and fertilizer had the obvious impact on production economics. Internal parasites are becoming an increasing concern for livestock and poultry producers. No new products for control are being developed and organisms are becoming resistant to existing products.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Case Study
- Other (Secondary Data)

Evaluation Results

Data related to animal productin outputs and outcomes are included this year in the new Planned Program - Global Food Security & Hunger

Key Items of Evaluation

Data related to animal productin outputs and outcomes are included this year in the new Planned Program - Global Food Security & Hunger

V(A). Planned Program (Summary)**Program # 4****1. Name of the Planned Program**

Economics & Commerce

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management	15%		30%	
602	Business Management, Finance, and Taxation	10%		20%	
603	Market Economics	5%		10%	
604	Marketing and Distribution Practices	5%		5%	
605	Natural Resource and Environmental Economics	5%		10%	
606	International Trade and Development	5%		5%	
608	Community Resource Planning and Development	25%		5%	
610	Domestic Policy Analysis	15%		10%	
611	Foreign Policy and Programs	0%		5%	
801	Individual and Family Resource Management	5%		0%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	5%		0%	
805	Community Institutions, Health, and Social Services	5%		0%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	30.0	0.0	8.4	0.0
Actual	30.8	0.0	5.5	0.0

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

Extension		Research	
Smith-Lever 3b & 3c 536794	1890 Extension 0	Hatch 200581	Evans-Allen 0
1862 Matching 436136	1890 Matching 0	1862 Matching 205834	1890 Matching 0
1862 All Other 3097153	1890 All Other 0	1862 All Other 1444153	1890 All Other 0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

- Conducted research and facilitated the development and adoption of new technologies and products that will enhance global competitiveness
- Conducted economic and policy research and evaluations that may increase economic efficiencies and improve socioeconomic conditions
- Created and distributed educational products and materials using print and electronic mediums
- Developed and conducted educational meetings
- Provided professional services to clientele
- Developed, evaluated, and disseminated education programs and curricula, incorporating new research
- Developed county and economic profiles for educational purposes
- Convened issue forums for both internal and external audiences

2. Brief description of the target audience

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

V(E). Planned Program (Outputs)**1. Standard output measures**

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	16000	102000	1500	100
Actual	17925	105888	586	746

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

Year: 2009
Plan: 0
Actual: 0

Patents listed**3. Publications (Standard General Output Measure)****Number of Peer Reviewed Publications**

2009	Extension	Research	Total
Plan	10	20	
Actual	65	29	94

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	Target	Actual
2009	320	460

Output #2**Output Measure**

- Number of scientific publications.

Year	Target	Actual
2009	14	9

Output #3**Output Measure**

- Number of graduate students completing degrees.

Year	Target	Actual
2009	10	16

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

O. No.	OUTCOME NAME
1	Number of participants who increase knowledge, understanding, awareness, and/or application skills of economics and commerce.
2	Number of participants who indicate a change in behavior or act upon or plan to act upon what they've learned about economics and commerce
3	Number of non-business bankruptcy filers in Arkansas
4	Sustainable, vibrant and globally competitive agricultural sector for Arkansas as indicated by Arkansas Cash Farm Receipts (in thousand dollars) (NASS)
5	Sustainable, vibrant and globally competitive agricultural sector for Arkansas as indicated by Arkansas Net Farm Incomes (in thousand dollars) (ERS)
6	Number of jobs created or retained through educational programs
7	Dollars of revenue generated by businesses as a result of educational programs

Outcome #1**1. Outcome Measures**

Number of participants who increase knowledge, understanding, awareness, and/or application skills of economics and commerce.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	34329	54994

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Congress is considering several bills designed to slow down climate change by either taxing carbon emissions or imposing a cap-and-trade system. Little research has been conducted on the possible impacts of these proposed policies on the agricultural sector in the US and in Arkansas. While there exists a small, and relatively unused, carbon market in the U.S., legislation currently being considered could increase the price of carbon from the current trading price of \$0.50 to an estimated \$30 to \$40 per ton. Given the fact that agriculture is one of the few ways to sequester carbon to sell, and each crop sequesters a different amount of carbon, this could have major implications for cropping patterns. Little research has been conducted on how various carbon prices would affect producer revenue and cropping patterns in the US, and the literature is nearly void in Arkansas.

What has been done

A model was constructed to estimate the impact of various carbon policies on agricultural producers in Arkansas. This model can estimate changes in cropping allocations as well as changes in producer revenue on a county level under different policy scenarios. This model has been developed using county and crop production specific information to offer county level and crop specific detail on carbon emission and sequestration. Therefore the model is able to estimate crop specific carbon foot print (both emissions and sequestration by production practice and production location) to measure county crop farm income impacts of various GHG policies. The sequestration portion of the model took into account the soil portfolio in each county, the tillage practices, and harvest indices for each crop in each county. From this an estimate of sequestered carbon per acre per crop per county could be obtained.

Results

The emissions portion of the model gives policy makers estimates of the impacts of various carbon/ GHG policies on Arkansas producers. The estimates also give commodity groups an idea of where they stand in terms of GHG emissions in comparisons to alternative crops. The results were presented to two commodity groups (Rice Federation and Cotton Incorporated) as invited seminars. The sequestration portion of the model sets forth a new methodology for measuring carbon emissions as well as providing policy makers the implications of carbon offset (sequestration) market. The models estimates have been used by commodity groups (Cotton Incorporated) to assess how a carbon offset market would affect cotton producers in Arkansas and around the country. The estimates also provide policy makers a snapshot of how various carbon offset prices will affect cropping patterns and resulting input and output prices.

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
605	Natural Resource and Environmental Economics
606	International Trade and Development
608	Community Resource Planning and Development
610	Domestic Policy Analysis
611	Foreign Policy and Programs
801	Individual and Family Resource Management
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

Outcome #2

1. Outcome Measures

Number of participants who indicate a change in behavior or act upon or plan to act upon what they've learned about economics and commerce

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	3000	8589

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Rice is the most trade-distorted crop exported by the US due to protectionist policies of many Asian and European countries. The rice market is particularly unstable because it is subject to: 1) the Asian monsoon weather; 2) high levels of trade protection; 3) a high degree of market segmentation based on product differentiation at the production, processing and consumption levels. Arkansas is the leading rice-producing state in the U.S. and Arkansas rice producers are particularly vulnerable to instability in domestic and international rice prices and costs of production. In a number of recent years Arkansas rice producers have depended heavily upon the price and income supports of the U.S. federal government to provide income and market stability. The potential for reduction in support levels in response to federal deficits, WTO dispute rulings, and Doha round proposals has become a threat to maintaining the safety net for Arkansas and U.S. rice producers.

What has been done

Arkansas Global Rice Project (AGRP): A team headed by Dr. Eric Wailes has developed the Arkansas Global Rice Model (AGRM). This model generates a 10-year baseline projection of the global rice market including all major rice producing, consuming, and trading nations. The AGRM provides estimates of production, consumption, trade, prices, and stocks based on historical supply and demand relationships, policies, and macroeconomic variables such as population and income growth. From this baseline, the model can be used to simulate the impacts of government policies and other "shocks" to the global rice market. During the past year, AGRM was used to evaluate impacts of alternative bio-fuels policies and the role of policy in explaining the extraordinary high price spikes in global rice prices in 2008.

This team also maintains, RICEFLOW, a spatial equilibrium model which estimates country-to-country rice trade by rice type and degree of milling. This model is particularly useful to evaluate regional trade agreements, transportation, and other transaction cost impacts.

More recently, the rice economics research program has also used a computable general equilibrium CGE model of the global rice economy using the GTAP framework to capture impacts of policy changes not only on the rice product market but also related commodity market and input factor markets such as labor and capital.

Results

The research on the global rice economy and analysis of trade protection has received considerable attention from the World Bank, the United Nations, the U.S. Congress and many policy decision-makers in the U.S. and the rest of the world. The World Bank, OECD, FAO, and the Government of Japan have requested assistance from the Arkansas Global Rice Economics team in developing their rice market analysis. This analysis is unique due to its recognition of both long and medium grain rice markets, which no other research group conducts. It is unique because we are not constrained to use 'official' government data or policies in our analysis and therefore maintain a greater degree of objectivity. The beneficial outcomes of our models include better production, processing, and consumption decisions by market participants and better policy decision-making by the U.S. and foreign governments.

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
605	Natural Resource and Environmental Economics
606	International Trade and Development
608	Community Resource Planning and Development
610	Domestic Policy Analysis
611	Foreign Policy and Programs
801	Individual and Family Resource Management
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

Outcome #3**1. Outcome Measures**

Number of non-business bankruptcy filers in Arkansas

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	23031	15577

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

More consumers are facing job loss, longer-term job loss, and reduced work hours. According to the Bureau of Labor Statistics; the number of unemployed persons was 15.3 million and the unemployment rate was 10.0 percent, in December 2009. At the start of the recession in December 2007, the number of unemployed persons was 7.7 million, and the unemployment rate was 5.0 percent. Among the unemployed, the number of long-term unemployed (those jobless for 27 weeks and over) continued to trend up, reaching 6.1 million. The number of persons employed part time for economic reasons (sometimes referred to as involuntary part-time workers) was about 9.2 million in December. These individuals were working part time because their hours had been cut back or because they were unable to find a full-time job.

What has been done

The Cooperative Extension Service provided the latest research-based information to assist Arkansas consumers who are dealing with income loss. Extension is part of the state-wide Governor's Task Force for Dislocated Workers. The task force is a group of agencies who provide information for employees in companies that are facing major lay-offs or plant closings. The Extension publication, Living Resourcefully with Reduced Income, was revised and updated. A new suite of materials entitled Stretch Your Dollar, teaches consumers how to make the most of their household budget by cutting everyday expenses. An online site was created for agent resources.

Results

County Family and Consumer Science agents presented financial management information at dislocated worker events. The program was conducted in 13 counties for several hundred dislocated workers. Additionally, county agents held a variety of educational programs to help consumers learn methods to reduce household spending. Coffee and Coupons was a program designed to help consumers reduce their household expenditures by using coupons and recommended shopping techniques. In Phillips County, where the program was developed, 312 consumers reported saving more than \$11,000 using coupons between March and September 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #4**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	Quantitative Target	Actual
2009	6100543	8347269

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The 2008 Farm Bill (Food, Conservation, and Energy Act of 2008) was enacted into law June 18, 2008. The implementation of the farm bill, given its release date and complexity, continues to be challenging. It is critically important to Arkansas' agricultural sector to understand what's in the farm bill and how it relates to farm profitability.

Producers, grain elevators, and industry leadership are asking tough questions about how this legislation, and the changing economy, will impact farm operations and businesses. In a nutshell, they are asking what are the risks and opportunities.

What has been done

Our Extension farm bill educational program included: maintaining and strengthening our educational working relationship with the Farm Service Agency and other organizations, establishing a Farm Bill Resource page where Extension clientele had daily access to an array of farm bill educational materials including voice-over power point presentations on each of the farm bill titles and other topics. The web page was designed to be a one stop location for farm bill educational materials, USDA and FSA releases, news, and other farm bill items. Another key focus which had significant impact was related to changes in payment limitation provisions. We developed a large body of work on what constitutes recognized management practices to meet the actively engage 2008 Farm Bill payment limitation provisions.

Our economic outlook educational and research program placed primary emphasis on a realistic overview of the agricultural situation and outlook with a focus on rice situation and outlook, followed by a study of the domestic and global economic, policy and trade settings. This information was then brought together into a big picture "boots on the ground" perspective to be able to address questions in real time. This research allowed us to evaluate and answer an array of clientele questions.

Results

We were very successful in working closely with our USDA Farm Service Agency (FSA) partner. This allowed us to significantly leverage our farm bill educational efforts, compliment their educational and program delivery efforts and maximize clientele benefits. We worked with FSA conducting farm bill meetings statewide. A key example of our farm bill work was the challenges of educating producers on the Acreage Crop Revenue Election (ACRE) Payment program. We did extensive analysis on the ACRE program. Our research concluded that row crop

producers should exercise caution in participating in this program. We delivered our final educational product through media, our web page, meetings and the Farm Service Agency. Our Delta Farm Press ACRE article was the most read article on their internet site for a number of days after it was published. Directly or indirectly, all Arkansas producers, and many regional producers, made their final ACRE participation decision taking our research and educational efforts into account.

Another farm bill educational example that is hard to quantify, but had significant impact, was our assistance in helping lawyers, the Farm Service Agency, and producers define what constitutes recognized management practices to meet the actively engage 2008 Farm Bill payment limitation provisions. Our work provided key insights for FSA into implementation and assisted producers in meeting their eligibility requirements.

The dangerous deceleration in global economic activity due to the financial crisis exposed our producers to elevated levels of risk, uncertainty, and market volatility. Our economic outlook effort provided our agricultural producers with insight into the problem and helped them recognize the risks and capitalize on opportunity. To assist producers, bankers, landowners and others in estimating their costs economists provided an array of row crop planning budgets. To assist in the area of market outlook economists provided information at county and area producer meetings, through print media, radio, podcasts and our web site. On a monthly basis we will average over 20,000 site visits to our policy and outlook materials. An example of one-on-one commercial assistance we worked closely with a grain elevator to help them navigate the huge moves in price volatility.

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
605	Natural Resource and Environmental Economics
606	International Trade and Development
610	Domestic Policy Analysis
611	Foreign Policy and Programs

Outcome #5

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	Quantitative Target	Actual
2009	2160253	3091113

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Ground water use from the Alluvial Aquifer in Arkansas is considered to be unsustainable in the sense that water use exceeds recharge. To reach sustainable pumping levels, the United States Geological Survey's 2006 estimates indicated that certain Arkansas Delta counties will need to reduce ground water use, the main source of irrigation water, by as much as 67%. Most affected is rice, currently the most profitable crop in Arkansas. At the same time, there is growing interest towards bioenergy crops. Perennial switchgrass and forage sorghum are analyzed here. Both crops require less water than traditional row crops in the region. If, in the future, water use is restricted in the Delta, could producers make money by switching from traditional crops to bioenergy crops? How does that change cropping patterns and where in the state?

What has been done

A model was developed to explore how producers might alter their cropping decisions if water pumping in the Delta was restricted to "sustainable" levels, and, at the same time, markets were developed for bioenergy crops such as switchgrass and forage sorghum. Initial research with the model looked at two scenarios of water: (1) full sustainability of the aquifer; and (2) restricting irrigation to a lesser extent than full sustainability to extend the life of the aquifer. Both scenarios were modeled with and without the addition of less water-intensive bioenergy crops at various price levels.

Results

If water use is restricted, agricultural income declines in Delta counties. However, the introduction of biomass crops at prices between \$50 and \$55 per dry ton would at least partially negate these economic losses regionally and completely for the entire state. In other words, spatial agricultural income redistribution is inevitable but much less drastic with the introduction of biomass crops than without. The results suggest that farmers need to look to non-groundwater based sources of irrigation water by either using irrigation water more efficiently and/or utilizing man made irrigation storage alternatives. The model results also have implications for rice and cotton processing industries as crop acreage patterns change with the existence of less water-intensive crops and/or irrigation restrictions. Further research is needed to arrive at more concrete answers, especially in light of the uncertain market potential for bioenergy crops to date and perhaps for several more years.

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
605	Natural Resource and Environmental Economics
606	International Trade and Development
610	Domestic Policy Analysis
611	Foreign Policy and Programs

Outcome #6**1. Outcome Measures**

Number of jobs created or retained through educational programs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	3000	5086

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Another major issue in Arkansas, especially in the rural areas, is the increasing economic stress on households and communities related to loss of manufacturing jobs. Manufacturing, like farming, is very important to rural areas. Because off-farm employment is an important source of income for many farm families, manufacturing is vital to the rural economy. More than a third of the counties in Arkansas depend largely on manufacturing employment. However, manufacturing, especially non-durable manufacturing, continues to downsize and relocate to those locations where the costs of production are lower. It is clear from the rural development research that the traditional manufacturing industries are not likely to improve economic conditions for rural areas. Nonetheless, many community and business leaders continue to try to recruit these industries instead of exploring alternative economic development strategies, particularly those that utilize local resources and are sustainable over the long run. In those communities suffering from the loss of jobs and economic opportunities, population is declining, and the quality of life is suffering. The economic decline creates greater fiscal stress for local governments and these communities are becoming more vulnerable to both natural and economic disasters.

What has been done

Community development programs in Arkansas have focused on building local capacity for social and economic improvement. University of Arkansas Community Economic Development faculty are helping to create economic opportunities and community resiliency to social and economic hardship through education, outreach and technical assistance with four major programming activities: visioning and strategic planning; economic development programming; small business development; and local government educational programs and technical assistance. In the past year, Community Economic Development faculty and extension educators have provided outreach in the form of statewide and county conferences, workshops, seminars and community planning sessions. They have also engaged in applied research and evaluation, collecting data on community conditions and the effectiveness of intervention strategies though both quantitative (secondary data) and qualitative methodologies (primarily focus groups and roundtables).

Results

Participants in CED programs have learned how to a) build their local capacity for improving social and economic conditions; b) organize to create specific changes in their communities; and c) implement diverse economic development strategies. They have increased their human and social capital through both formal and informal education, and by working with local and state education programs to improve the availability and quality of schooling in their communities. They created new economic opportunities by taking on new and innovative community based projects designed to bring more dollars into their communities (such as county fair activities and multi-county garage sales). They have created significant numbers of new job opportunities by developing new value-added ventures (such as biofuels plants and a new sweet potato storage facility) and direct marketing ventures (farmers markets, fruits and horticultural enterprises). They have enhanced historical, cultural, natural resource based assets and increased agritourism, bringing in more tourism dollars into their communities. Some have taken advantage of new technologies to bring broadband into their communities and others have used broadband to create new e-commerce businesses. They have also improved the quality of their lives, providing new housing, removing derelict housing, beginning new programs for youth and improved the quality and access to health care, and other critical services in their communities.

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
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

Outcome #7

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	75000000	168731258

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The 2008 Farm Bill contained several renewable energy programs that provide grants and/or loans to groups, individuals, government entities, organizations, etc. to develop renewable energy projects. The various programs were designed to be administered by four different government agencies depending on the type of program. It is often difficult for persons to glean information from a document as large as the Farm Bill to determine if they qualify for participation in the various programs.

What has been done

The purpose of this project was to review the renewable energy programs contained in the Farm Bill and publish pertinent information in a fact sheet. The fact sheet would identify the program, the funding agency, application process, funding available, and the contact about the program including telephone numbers, e-mail addresses, and mailing addresses. Research was conducted to obtain the necessary information from the 2008 Farm Bill. Agencies administering the programs were contacted to document their administering the programs. Checks were conducted to test for correct e-mail addresses, telephone numbers, mailing addresses. The information was then compiled into a fact sheet by the Public Policy Center.

Results

The fact sheet helped extension agents working with clientele who have questions and are interested in participating in some of the energy programs. The fact sheet is a valuable resource and quick reference guide in providing clients with information on the energy programs. The fact sheet has also been utilized by Extension partners and collaborators who work with clientele that have interest in the energy programs. The fact sheet is available for access via the UA Division of Agriculture Public Policy Center website.

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
605	Natural Resource and Environmental Economics
608	Community Resource Planning and Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

Throughout the 2009 cropping season Arkansas producers were challenged by a wet spring, dry June, and then excessive rainfall again from July through harvest. A team led by Dr. Eric Wailes monitored the delayed harvest and crop losses throughout the fall and into winter. The team issues periodic estimates of the value of crop losses. The final report issued January 25, 2010 estimated total crop losses at \$397 million. These period reports were used by producers, commodity organizations and policy makers.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

Southern Region Water Research Project

Issue:

This project was undertaken by six states in the southern region of the United States to determine what measures are being taken by water districts and municipalities to conserve water during periods of drought. Over the past decade, there have been situations in various states where water supplies have

been severely depleted and have presented serious situations for water suppliers. The goal of this study was to survey as many water managers as possible in the six southern states to determine techniques used and installed when water supplies reached severe declines. The information from this study would be shared with water managers for use in implementing new methods of water conservation measures when necessary.

What has been done:

A survey instrument was developed by faculty from the six states participating in the project. The survey was designed to collect information on various water conservation techniques utilized by water managers throughout the south. Techniques included information related to installing water saving devices by homeowners to altering rate structures during periods of low water supplies. Each participating state developed a list of water managers with e-mail and mailing addresses. A preliminary (test) survey was sent to 15 water managers in the participating states to gain their input and critique of the survey before it was sent to all water managers. Once the critique was complete and recommended changes made to the survey, it was sent to as many water managers as possible in the six state areas. The survey has been completed and is in the analysis phase.

Results:

Once the results are tabulated, a summary of the project with recommended water conservation measures will be shared with water managers in the survey area. The information will be a valuable tool for use by water managers in implementing new and innovative water conservation measures in their municipalities and water districts. The information can also be shared with water managers in other parts of the country as appropriate. The expected outcome of this project is that water managers will have more tools to use and can time when tools are needed when water conservation becomes necessary. Managers will also have new ideas available to educate the public on installing devices to save water and lower water bills.

Key Items of Evaluation

Ballot Issues Education Initiative

Issue:

The Arkansas General Assembly has the authority to place three ballot issues before the vote of the citizens of the state. Amendment 7 of the Arkansas Constitution allows a process by which voters may propose legislative measures, laws and amendments to the Constitution. An initiative petition may propose an amendment to the Arkansas Constitution or an Act. The difference is an initiated act approved by the vote of the people creates a statute and may be altered or repealed by the Arkansas legislature by a two-thirds vote. An initiated constitutional amendment passed by the voters may only be changed by another vote of the people. To place a measure on the ballot, it is necessary for a sponsor group to submit petitions to the Secretary of State's Office with the signatures of citizens registered to vote in Arkansas. For an initiated act, a petition must contain the signatures of qualified voters equal to 8 percent of the total number of votes cast for the office of governor in the previous general election.

What has been done:

During the even numbered years in which there are ballot measures placed before the vote of the citizen of the state, the Public Policy Center initiates a Ballot Issues Education Program. In 2009, there were five issues on the ballot. The Center develops collateral materials including fact sheets, PPT presentations, posters, radio and television scripts, a DVD and instructions on how to report their activities in AIMS. County agents are briefed on the ballot issues via Center Training and one-on-one meetings. In addition, Center representatives made appearances on the Arkansas Educational Television Network, which was aired four times and on KTHV, the local CBS affiliate. The materials are primarily targeted to County Extension Agents for distribution at civic club meetings and other gatherings, but additional stakeholder groups, such as the League of Women Voters and the Arkansas Farm Bureau Federation request materials. For the first time since implementing the initiative, a Civics Lesson Plan was developed for school use. Ballot issues materials were placed on the Public Policy Center's website.

Results:

The collateral materials on the Center's website received 54,379 hits between October 1, 2009 and November 4, 2009. The number of hits in October was 35,161 and in November ballot issues information

received 20,150. Note that the discrepancy in the total can be accounted for because the web page statistics were provided through November 7, three days after the election took place.

17,415 fact sheets were distributed to all 75 County Extension Offices and an additional 497 were distributed to the Arkansas Natural Resources Center, the Arkansas Farm Bureau Federation and other stakeholders. Ninety foam-board displays were distributed to requesting counties and 67 DVDs containing a brief overview of the ballot issues to be shown at events were ordered by the counties. All five ballot measure were passed by the vote of the Arkansas citizens.

V(A). Planned Program (Summary)**Program # 5****1. Name of the Planned Program**

Families, Youth, & Communities

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
602	Business Management, Finance, and Taxation	3%		3%	
608	Community Resource Planning and Development	10%		10%	
610	Domestic Policy Analysis	5%		5%	
802	Human Development and Family Well-Being	30%		23%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	5%		10%	
804	Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures	5%		7%	
806	Youth Development	42%		42%	
	Total	100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	185.3	0.0	3.6	0.0
Actual	149.6	0.0	3.1	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2605515	0	424	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2116936	0	435	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
15033104	0	762363	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

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

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

4-H Youth Development programs provide opportunities for youth to acquire knowledge, develop life skills, form attitudes, and practice behavior that will enable them to become self directing, productive, and contributing members of society. Arkansas Extension addresses the professional development needs of school age care providers through the Arkansas 4-H Afterschool training program. School-age providers receive five hours of training in the areas of experiential learning, staff management, 4-H youth development, guidance and discipline, environmental stewardship, and service learning. The training materials are selected from existing 4-H curriculum and are adapted to fit the needs of providers working in after school settings.

Methods for providing programs entail:

Workshops

Training Sessions

One-to-one counseling

Curriculum development

Presentations

School enrichment programs

Organized 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

Senior citizens

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

Entrepreneurs

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	174550	147000	285150	51325
Actual	246414	271146	72150	66277

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

Patent Applications Submitted

Year: 2009

Plan: 0

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	0	
Actual	0	8	8

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Parenting Journey maps circulated

Year	Target	Actual
2009	36000	25000

Output #2

Output Measure

- Number of parenting education programs/trainings held for end users

Year	Target	Actual
2009	45	50

Output #3

Output Measure

- Number of participants in parenting programs/training

Year	Target	Actual
2009	2600	1500

Output #4**Output Measure**

- Number of hours of parenting program self-study training provided

Year	Target	Actual
2009	500	120

Output #5**Output Measure**

- Number of hits on www.arfamilies.org

Year	Target	Actual
2009	90000	1566684

Output #6**Output Measure**

- Number of marriage resources available in print or on www.arfamilies.org website

Year	Target	Actual
2009	36	25

Output #7**Output Measure**

- Number of hits on marriage resources on www.arfamilies.org website

Year	Target	Actual
2009	2000	25327

Output #8**Output Measure**

- Number of marriage education programs/trainings held for end user

Year	Target	Actual
2009	7	12

Output #9**Output Measure**

- Number of participants in marriage programs/trainings

Year	Target	Actual
2009	500	350

Output #10**Output Measure**

- Number of organized 4-H Clubs

Year	Target	Actual
2009	865	954

Output #11

Output Measure

- Number non-duplicated 4-H Youth Development Healthy Lifestyles programs delivered

Year	Target	Actual
2009	750	130

Output #12

Output Measure

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

Year	Target	Actual
2009	11000	5347

Output #13

Output Measure

- Number non-duplicated programs delivered in 4-H Youth Development Citizenship/Leadership

Year	Target	Actual
2009	360	35

Output #14

Output Measure

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

Year	Target	Actual
2009	550	38

Output #15

Output Measure

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

Year	Target	Actual
2009	1200	850

Output #16

Output Measure

- Number of Child Care educational trainings held

Year	Target	Actual
2009	110	85

Output #17**Output Measure**

- Number of Child Care online courses offered

Year	Target	Actual
2009	2	2

Output #18**Output Measure**

- Number of hours of Child Care in-service training offered

Year	Target	Actual
2009	15	15

Output #19**Output Measure**

- Number of hours of Child Care self-study training provided

Year	Target	Actual
2009	1500	4993

Output #20**Output Measure**

- Number of federal grants and contracts

Year	Target	Actual
2009	5	0

Output #21**Output Measure**

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

Year	Target	Actual
2009	174550	410711

Output #22**Output Measure**

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

Year	Target	Actual
2009	892	66739

Output #23**Output Measure**

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

Year	Target	Actual
2009	30	15

Output #24

Output Measure

- Number of train-the-trainer programs delivered in marriage programs

Year	Target	Actual
2009	50	2

Output #25

Output Measure

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

Year	Target	Actual
2009	450	610

Output #26

Output Measure

- Number of participants attending a babysitting course

Year	Target	Actual
2009	100	120

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

O. No.	OUTCOME NAME
1	Number of 4-H participants who learned accepting differences life skill
2	Number of 4-H participants who learned healthy lifestyles choices life skill
3	Number of 4-H participants who learned self-responsibility life skill
4	Number of 4-H participants who learned leadership life skill
5	Number of 4-H participants who learned marketable skills life skill
6	Number of 4-H participants who learned wise use of resources life skill
7	Number of child care providers who report an increase in knowledge related to specific child care issues after participating in an Extension program
8	Number of participants that increased knowledge of leadership development issues
9	Number of participants adopting an effective parenting behavior/practice
10	Number of participants adopting a targeted relationship-enhancing behavior
11	Number of participants adopting a targeted personal development behavior
12	Number of 4-H Journals completed in 4-H Youth Development Healthy Lifestyles areas
13	Number of projects completed in 4-H Youth Development Healthy Lifestyles areas
14	Number of 4-H Journals completed in 4-H Youth Development Citizenship/Leadership areas
15	Number of projects completed in 4-H Youth Development Citizenship/Leadership areas
16	Number of 4-H Journals completed in 4-H Youth Development science, technology, engineering & math areas
17	Number of projects completed in 4-H Youth Development science, technology, engineering & math
18	Number of child care providers adopting a recommended practice after participating in an Extension program

19	Number of participants who report an improved relationship with a child as a result of using a targeted parenting behavior
20	Number of participants who report an improved relationship with a partner as a result of using a targeted parenting behavior
21	Number of participants who report an improved quality of life as a result of using a targeted personal development behavior
22	Number of 4-H members receiving scholarships and grants for post secondary education
23	Number of volunteer hours contributed through the 4-H program by youth and adults who practice good citizenship and provide community-based leadership
24	Number of youth conducting community service projects as a result of leadership development educational efforts
25	Number of Refereed Journal Publications
26	Number of participants who indicate that they have gained knowledge on a targeted parenting behavior
27	Number of participants who indicate that they have gained knowledge on a targeted relationship-enhancing behavior
28	Number of participants who indicate that they have gained knowledge on a targeted personal development behavior
29	Number of 4-H participants who learned decision making life skill
30	Number of 4-H participants who learned communications life skill
31	Number of child care providers who indicate that they have gained knowledge on a targeted child care-giving behaviour
32	Number of participants who increased understanding of health and safety as a result of participating in the babysitting program

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1200	67

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 #2

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	13000	2726

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 #3

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	4000	226

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 #4

1. Outcome Measures

Number of 4-H participants who learned leadership life skill

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2500	711

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 #5

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2000	371

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 #6

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	4000	1896

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 #7

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	300	7499

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

In order to keep rates affordable for parents in already economically depressed areas, directors of schools and day care centers need to keep their overhead cost down. By being able to offer self-study courses, we assist child care providers who have very little access and/or knowledge of web-based systems. Since directors no longer pay to have their employees attend evening or Saturday sessions, center budgets aren't as strained and employee morale is maintained. This take-home type of course is growing more popular each year.

What has been done

Offered in each of the 75 counties, Guiding Children Successfully is available statewide. Annually, the training is showcased at statewide early childhood conferences to increase client awareness and interest in the program. An annual direct mailing is also conducted to remind early childhood professionals that the training is freely available to them any time.

Results

During the 2008-2009 program year, over 5,000 hours of training were completed by over 600 individuals. As a result of the program, relationships among center directors and their staff have reportedly improved. The centers are more financially sound thanks to the training savings which allows centers to hire additional staff as needed, or buy additional materials and supplies as needed. Employee satisfaction is maintained which encourages employee retention enabling child care centers to stay in compliance with licensing ratios of providers to youths.

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

Number of participants that increased knowledge of leadership development issues

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	3000	2744

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Improving the economic well-being and quality of life for Arkansans and Arkansas communities is increasingly challenging. Issues such as globalization, changes in information technologies, demographic shifts, threats of terrorism, and social needs all impact our society. Leadership development equips citizens and communities to deal with these issues and take advantage of related opportunities. Volunteers are a critical catalyst in the creation and sustainability of our vibrant and resilient communities.

What has been done

Education is provided to volunteers through a variety of programs, such as Extension Homemakers, 4-H youth development, and Master Gardeners. Target audiences include residents, lay leaders, quorum court members, community coalitions, civic groups, fair boards, fair volunteers, and advisory groups. Outreach ranges from formal leadership programs to education on individual topics for which skill development is needed. Programs also result in volunteer support for Extension programs to help further the mission of the organization.

Results

A key tenant of Extension's leadership development programs is the importance of volunteerism to the quality of life in Arkansas communities. Data shows that program participants are getting the message. Over 20,000 Extension volunteer contacts were made in 2009 in the area of leadership development. These contacts were associated with 213,352 volunteer hours. Volunteer data includes direct support of Extension programs; indirect service through service projects and methods other than face-to-face service; service learning to support the delivery of programs; and support through boards, committees, commissions, and advisory councils. Based on an hourly rate of \$19.51 (Arkansas Department of Human Services Division of Volunteerism), the result is an economic impact of over \$4.1 million.

4. Associated Knowledge Areas

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

Outcome #9

1. Outcome Measures

Number of participants adopting an effective parenting behavior/practice

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1000	233

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 #10**1. Outcome Measures**

Number of participants adopting a targeted relationship-enhancing behavior

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	110	48

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 #11**1. Outcome Measures**

Number of participants adopting a targeted personal development behavior

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	191

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 #12

1. Outcome Measures

Number of 4-H Journals completed in 4-H Youth Development Healthy Lifestyles areas

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	172

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 #13

1. Outcome Measures

Number of projects completed in 4-H Youth Development Healthy Lifestyles areas

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	450	296

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

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

What has been done

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

Results

During this past two years over 580 youth and adults have completed the 5-hour hands-on ATV Safety Institute ATV RiderCourse, over 10,00 youth have participated in classroom ATV safety education, and 100 plus youth and adults have served as community leaders in ATV safety. In addition through media efforts of TV, radio, and print we have had an audience over three million. Numerous partnerships have been established with groups such as Arkansas Children's Hospital, state agencies, dealerships, and other businesses and organizations to help deliver the program. State dealerships have provided over 40 loaner ATV units for use in delivering the RiderCourse program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #14

1. Outcome Measures

Number of 4-H Journals completed in 4-H Youth Development Citizenship/Leadership areas

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	50	26

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 #15

1. Outcome Measures

Number of projects completed in 4-H Youth Development Citizenship/Leadership areas

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	350	161

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 #16

1. Outcome Measures

Number of 4-H Journals completed in 4-H Youth Development science, technology, engineering & math areas

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	50	536

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 #17

1. Outcome Measures

Number of projects completed in 4-H Youth Development science, technology, engineering & math

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	400	1380

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 #18

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	150	1044

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Child care providers require training hours through the Traveling Arkansas' Professional Pathways (TAPP) system. This is the system that helps child care providers track the training hours they need to maintain licensure. Child care providers require flexibility in order to obtain the verified training they need.

What has been done

Offered 10 hours of child care provider training.

In 2009, 74 Best Care classes were offered in 39 counties. 1,865 Arkansas child care providers were trained. Best Care Connected offered 5 hours of online child care provider training. In 2009, 1,065 Arkansas child care providers were trained.

Guiding Children Successfully offered 28 hours of video and curriculum-based training. In 2009, 610 providers were trained.

Results

64% of Best Care participants indicated they intend to change their behavior to help children be more healthy and safe as a result of attending a Best Care Training.

86% of Best Care Connected participants agreed or strongly agreed that they plan to do one or more new things to improve their child care giving practices as a result of BCC.

Thirty-two providers returning their 3 month evaluation indicated they had made 433 positive changes in their day care centers or their behaviors.

4. Associated Knowledge Areas

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

Outcome #19

1. Outcome Measures

Number of participants who report an improved relationship with a child as a result of using a targeted parenting behavior

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2500	143

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 #20**1. Outcome Measures**

Number of participants who report an improved relationship with a partner as a result of using a targeted parenting behavior

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	7

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 #21**1. Outcome Measures**

Number of participants who report an improved quality of life as a result of using a targeted personal development behavior

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	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
802	Human Development and Family Well-Being

Outcome #22

1. Outcome Measures

Number of 4-H members receiving scholarships and grants for post secondary education

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	60	102

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 #23

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	40000	97363

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 #24

1. Outcome Measures

Number of youth conducting community service projects as a result of leadership development educational efforts

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	500	56

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Youth are an important asset to communities, state, and the country. It's important to provide leadership development opportunities for today's youth since they represent the leaders of tomorrow. This is particularly important in light of documented declines in social capital and in rural areas that are struggling with population decline.

What has been done

Education programs in leadership development are conducted at the state and county levels. Although programs commonly target youth and adults separately, Carroll County Leadership is an integrated program where youth and adults learn together. The program consists of nine one-day sessions and an overnight trip to the state's capital. Topics include strategic planning, communication, personality theory, history, economic development, public safety, cultural diversity, education, health and human services, government, and quality of life.

Results

Community leaders and elected officials have great respect for class members and the resulting impacts of the program on the entire county. In 2009, two Carroll Leadership youth alumni took the initiative to approach school administrators about conducting an educational program on "staying true to yourself" and staying away from drugs. Drug use is a particularly troubling issue in this rural county. With the encouragement of school administration and faculty, these young leaders gave a powerful presentation to nearly three hundred 7th grade students across the county, earning the respect of local leaders and, perhaps more importantly, their peers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation
608	Community Resource Planning and Development
610	Domestic Policy Analysis
806	Youth Development

Outcome #25

1. Outcome Measures

Number of Refereed Journal Publications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	15	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
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- 802 Human Development and Family Well-Being
- 803 Sociological and Technological Change Affecting Individuals, Families, and Communities
- 804 Human Environmental Issues Concerning Apparel, Textiles, and Residential and Commercial Structures
- 806 Youth Development

Outcome #26

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	4000	503

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 #27

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	170	67

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 #28

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	425	234

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 #29

1. Outcome Measures

Number of 4-H participants who learned decision making life skill

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	700	1251

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 #30

1. Outcome Measures

Number of 4-H participants who learned communications life skill

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2500	1405

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 #31

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	450	610

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

UA students majoring in Child Development, Early Childhood Education, Nursing, Speech Pathology, and Psychology need opportunities to work directly with children in developmentally appropriate early childhood settings. Programs that are NAEYC accredited and staffed with mentors who have master's degrees are required. Model early childhood programs are necessary as a setting for this valuable training.

What has been done

The UA Infant Development Center and the UA Nursery School are accredited by the National Association for the Education of Young Children. Master teachers do exemplary jobs of meeting the needs of the children and parents as they mentor the UA students in daily applied research monitoring the children's progress based on assessment tools and observation and then comparing to accepted theoretical perspectives. Students in the Child Development Practicum conducted short research projects with the children.

Results

UA students reaped the benefits of being mentored by master teachers at the UA Infant Development Center and UA Nursery School. Direct, monitored interaction with the youth influences the students as they learn developmentally appropriate ways to guide children and plan curriculum to make the greatest impact. Students then go out and mentor other teachers and early childhood professionals and also have a direct impact on the many children who will be in their care.

4. Associated Knowledge Areas

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

Outcome #32

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	100	120

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

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.)
- Other (Fuel prices & loss of personnel)

Brief Explanation

External funding and a change in priority programming impacted the reporting efforts for several of the

programs originally designated as priorities within the Families, Youth and Communities initiative. The economic downturn during the year impacted how programming resources were aligned; therefore, impacting the delivery of some programs. Additionally, a reduction in staff (FTEs) also had a negative impact on program delivery and reporting. Competing external youth and adult programs impacted outcomes significantly.

Output 1 Parenting Journey maps: Over-targeted the number of maps that would be distributed.

Output 3 Parenting programs: The target number should have been entered as 260 rather than 2600.

Output 4 Parenting self-study: GCS offers up to 28 hours of training. It was projected that 30 people would participate assuming that not every participant would complete every unit of training. However, only 15 individuals actually participated.

Output 9 Marriage program/trainings: The number was under-reported and may have also been affected by the retirement of several county agents.

Output 16 Child Care trainings: Over-targeted the number of trainings that would be held.

Output 23 Parenting self-study: GCS is a supplemental training program. Some counties held enough parenting trainings throughout the year to meet the needs of parents across the state.

Output 24 Marriage programs: Over-targeted the number of trainings that would be held.

Outcomes # 1, 2, 3, 4, 5 - Numbers for these outcomes appear to be under-reported as to the actual program conducted in the state. Not all counties are reporting.

Outcome 9 Parenting: Numbers were under-reported and may have also been affected by the retirement of several county agents.

Outcome 10 Relationship-enhancing behavior: The number was under-reported and may have also been affected by the retirement of several county agents.

Outcomes # 12, 13 & 15 - Numbers for these outcomes appear to be under-reported. In addition, there is a normal fluctuation of participation with the emphasis on Science and Technology.

Outcome 19 Improved relationship with a child: This should have been entered as 250 rather than 2500. In addition, the number was under-reported and may have also been affected by the retirement of several county agents.

Outcome 20 Targeted relationship enhancing behavior: The target for this was posted at 100, not 200.

Outcome 24 Community service projects: Data from previous years was over-reported, leading us to over-target the number of youth to be involved.

Outcome 26 Targeted parenting behavior: This number should have been entered as 400 not 4000.

Outcome 27 Targeted relationship-enhancing behavior: The number was under-reported and may have also been affected by the retirement of several county agents.

Outcome 28 Targeted personal development behavior: Due to a lack of time and resources for Information Technology, we were not able to expand the course this year.

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

1. Evaluation Studies Planned

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

Evaluation Results

86% of Best Care Connected participants agreed or strongly agreed that they plan to do one or more new things to improve their child care giving practices as a result of Best Care Connected.

Thirty-two providers returning their 3 month evaluation indicated they had made 433 positive changes in their day care centers or their behaviors. These changes helped to create a safer and more developmentally appropriate learning environment for the children in their care.

1,865 Arkansas child care providers were trained through 74 Best Care classes.

1207 4-H participants learned decision making life skill.
397 non-duplicated 4-H organized clubs (community, project, in-school) were maintained.
513 projects in leadership completed.

Key Items of Evaluation

The field of child development has become more important as research-based information about teaching methodology has become recognized for its potential to help children succeed. Teachers of young children increasingly seek research based information to maximize their effects on their student. Beginnings is a publication produced and published four times per year to support the work of early childhood professionals throughout the State of Arkansas. The publication is produced by Child Development faculty and community leaders with expertise in child development and disseminated electronically. Content addresses classroom environment, child guidance, and teaching methodologies. Since Beginnings is on the internet, it has the potential to impact the effectiveness of every child care professional in Arkansas and thus, to make a difference in the outcomes for children. Beginnings is published through a collaboration of the Arkansas Division of Child Care and Early Childhood Education, who fund the work, and the School of Human Environmental Sciences at the University of Arkansas.

V(A). Planned Program (Summary)**Program # 6****1. Name of the Planned Program**

Food, Nutrition & Health

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

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

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	86.8	0.0	22.9	0.0
Actual	52.5	0.0	0.3	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
915302	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
743668	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
5281043	0	111481	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Health and Nutrition:

The U of A Division of Agriculture faculty will develop, evaluate, and disseminate education programs, curricula, and educational publications. Conduct workshops, training and activities that incorporate new research emphasizing healthy lifestyles. Programs include but are not limited to:

Walk Across Arkansas (Adults and Youth)- MOVED TO CHILDHOOD OBESITY PLANNED PROGRAM
Strong Women
ServSafe- MOVED TO FOOD SAFETY PLANNED PROGRAM
Food Stamp Nutrition Education- MOVED TO CHILDHOOD OBESITY PLANNED PROGRAM
FF-News- MOVED TO CHILDHOOD OBESITY PLANNED PROGRAM
Expanded Food and Nutrition Education Program- MOVED TO GLOBAL FOOD SECURITY AND HUNGER
Reshape Yourself Healthy Weight Program
Arthritis Education Series
Medwise
Food Preservation and Safety- MOVED TO FOOD SAFETY

Commercial Food Safety & Processing:

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

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

Conduct quarterly HACCP Roundtable meeting
Conduct food safety workshops
Conduct Better Process Control School
Conduct labeling workshop
Conduct the ServSafe workshop
Provide online distance education in food safety and manufacturing
Conduct new product development workshop
Provide assistance to small food companies and entrepreneurs in the form of services, nutritional labeling, and consulting
Conduct culinology workshop for food technologist
Conduct research

2. Brief description of the target audience

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

Food companies- MOVED TO FOOD SAFETY
Entrepreneurs and restaurants- MOVED TO FOOD SAFETY
Food service employees and/or food handlers- MOVED TO FOOD SAFETY
Limited resource adults and youth
Minority adults
Youth, adults and senior adults
Employers & employees- MOVED TO FOOD SAFETY
Child care providers
School personnel

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	56150	20000	60000	2000
Actual	50849	4556	292	325

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

Patent Applications Submitted

Year: 2009
 Plan: 1
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	40	
Actual	0	40	70

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Target	Actual
2009	10	46

Output #2

Output Measure

- # of news articles, public service announcements, radio and TV media programs in support of Food, Nutrition and Health programs

Year	Target	Actual
2009	444	750

Output #3

Output Measure

- # of participants in educational programs leading to certification for food handlers (ServSafe and Better Process Control School)
 Not reporting on this Output for this Annual Report

Output #4**Output Measure**

- # of participants in quarterly HACCP roundtable

Year	Target	Actual
2009	30	0

Output #5**Output Measure**

- # of ServSafe classes offered
Not reporting on this Output for this Annual Report

Output #6**Output Measure**

- # of non-duplicated Food, Nutrition and Health 4-H Youth programs delivered
Not reporting on this Output for this Annual Report

Output #7**Output Measure**

- # of non-duplicated participants in Food, Nutrition, and Health 4-H Youth programs
Not reporting on this Output for this Annual Report

Output #8**Output Measure**

- # of Food, Nutrition and Health in-service trainings conducted

Year	Target	Actual
2009	10	16

Output #9**Output Measure**

- # of Arkansas Commodity Board Grants

Year	Target	Actual
2009	5	5

Output #10**Output Measure**

- # of Federal grants and contracts

Year	Target	Actual
2009	7	14

Output #11**Output Measure**

- # of Food, Nutrition, and Health clientele contacts from education classes, workshops, group discussions,

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

Year	Target	Actual
2009	116150	50407

Output #12

Output Measure

- # of Food, Nutrition, and Health education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational events

Year	Target	Actual
2009	7825	2645

Output #13

Output Measure

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

Year	Target	Actual
2009	20	75

Output #14

Output Measure

- # of food processing and safety laboratory services provided

Year	Target	Actual
2009	30	13

Output #15

Output Measure

- # of extension educators involved in discussions regarding public and organizational nutrition and health policies, regulations and industry practices.

Year	Target	Actual
2009	15	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 food, nutrition and health following an educational class, seminar or workshop
2	# of participants receiving certification in Better Process Control School, Culinary Scientists and ServSafe
3	# of 4-H journals completed in Food, Nutrition and Health
4	# of individuals who increased physical activities as a result of completing an Extension program
5	# of nutritional labels developed
6	# of Journal articles accepted
7	# of participants who adopted positive nutrition practices.
8	# of participants reporting reduction in body weight after completing a nutrition education program
9	# of participants reporting reduction in blood pressure after completing a nutrition education program
10	# of participants reporting a reduction in blood cholesterol after completing a nutrition education program
11	# of participants reporting a reduction in blood glucose after completing a nutrition education program
12	# of new food businesses started
13	# of participants who indicate that they intend to adopt one or more healthy food/nutrition practices
14	# of culinary participants sampled by survey that reported actual practice change as a result of the workshop within 2 years
15	# of small and very small meat and poultry plants that successfully completed an Action Plan developed in consultation with the University of Arkansas after a USDA-FSIS Food Safety Assessment

Outcome #1**1. Outcome Measures**

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	18000	1380

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

In 2002, 59% of Americans reported consumption of over-the-counter (OTC) medication within the previous 6 months. Medication misuse costs the nation well over \$177 billion dollars annually, resulting in extra physician visits, avoidable medication side effects, loss of productivity on the job, prolonged or exacerbated illnesses, unnecessary emergency room visits, hospitalizations and even death.

What has been done

A medication literacy awareness initiative entitled "Be MedWise Arkansas" was launched in 2009 to address the serious and rising problem of medication misuse. This program partners with the National Council for Patient Information and Education (NCPPIE) and several local agencies, including the Poison Control Center and the University of Arkansas for Medical Sciences College of Pharmacy. The first of several interactive lessons was taught to raise awareness of reading drug facts labels before taking medicines and utilizing pharmacists for patient education.

Results

During 2009 over 600 Arkansans were taught how to read the drug facts label. Of the two hundred individuals surveyed (average age of 62), 80% reported they took an OTC in the last two weeks. Most medicines were taken for pain, followed by cold/allergy symptoms. Only 41% of participants reported that they always read the drugs facts label before buying an OTC, 28.5% reported overdosing on OTCs, 68% of all surveyed were taking both OTC and prescription drugs at the same time. After the lessons, 97% of participants indicated an improvement in knowledge and intended to use at least 1 technique they learned in class. Participants reported the most important things learned were to read the entire drugs facts label, be more careful about mixing medicines, and utilize their pharmacists more with questions.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

of 4-H journals completed in Food, Nutrition and Health

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	172

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
806	Youth Development

Outcome #4

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	Quantitative Target	Actual
2009	1000	585

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Obesity has reached epidemic proportions with over a third of the U.S. population weighing in as obese (indicated by a BMI of 30 kg/m² or higher). Obesity increases the risk of mortality and many chronic diseases (i.e., heart disease, cancer, diabetes, etc.) and other health problems (i.e., respiratory, gynecological, developmental, etc). Ultimately, obesity decreases a person's quality of life and overburdens the health care system, attributing up to \$1 billion dollars in health care costs in Arkansas alone.

What has been done

To combat the rise in obesity rates and in increasing the physical level of Arkansas residents, the Cooperative Extension Service offered several programs including Strong Women (strength training program for middle-aged and older women), Walk Across Arkansas (an 8-week walking program for youth through senior adults), and the Arthritis Foundation Life Improvement Series (AF exercise program, AF Aquatic Program, AF Tai Chi, and AF Self-Help with exercise option).

Results

With the Strong Women program, 40,840 individuals participated and of those surveyed, 65% improved upper body strength, 65% improved lower body strength, 60% improved balance, 59% improved upper body flexibility, and 58% increased aerobic endurance. The Walk Across Program included 3,156 participants walking a total of 198,770 miles leading to a potential cost benefit in healthcare savings for Arkansas of \$797,540 for 2009.

Participants also reported improvement in energy, food habits, sleep, blood work, quality of life, stress as well as deepening relationships. With the Arthritis Foundation Life Improvement series, 1,399 individuals participated and of those surveyed, 91% reported joint benefit.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #5

1. Outcome Measures

of nutritional labels developed

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	120	55

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products
503	Quality Maintenance in Storing and Marketing Food Products

Outcome #6

1. Outcome Measures

of Journal articles accepted

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	40	70

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Obesity is a multifactorial condition and a major public health concern affecting all demographic segments of the population, independent of race, culture, and/or ethnicity. For decades obesity has been an epidemic in the United

States (US), and the proportion of overweight and obese adults in the population continues to rise. An alarming 34% of adults in the US are currently obese, which is significantly greater than was reported a decade ago. Although, obesity is a major health problem in the US, there are no proven, long-lasting, and widely applicable approaches to weight loss. Obesity has been recognized as a national epidemic and it is anticipated that soon it will surpass smoking as the number one behavior-related cause of mortality among adults in the US. However, it is well accepted that nutrition plays a major role in the prevention/treatment of obesity.

What has been done

The incidence of obesity in the State of Arkansas was greater than 26% in 2008. Preventing obesity is the focus of this proposed project as it is associated with increased risk of hypercholesterolemia, diabetes and hypertension. We are currently conducting animal studies that are evaluating the role of functional foods such as blackberries (both processed and fresh), fructooligosaccharides, and conjugate linoleic acid in the prevention of chronic conditions associated with increased body weight.

Results

The findings of the study are of significance as they can bring forth evidence that certain foods can help reduce the complications associated with excess body weight. This will translate to decreased burden on our health care costs and loss of productivity costs. Furthermore, the findings are of commercial interests. Soybeans and Blackberries are important crops in Arkansas. As they are shown to be beneficial in preventing obesity, these foods can be included more broadly in our diets, thereby improving our agricultural economy and decreasing our health care burden.

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products
503	Quality Maintenance in Storing and Marketing Food Products
703	Nutrition Education and Behavior
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #7

1. Outcome Measures

of participants who adopted positive nutrition practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1300	619

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 #8

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	Quantitative Target	Actual
2009	170	156

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Excess weight in the form of body fat is linked to increased risk for cardiovascular disease, diabetes and certain types of cancer. In Arkansas, two-thirds of adults are overweight or obese. Research shows that even small decreases in weight can lower the risks for these chronic diseases. It is estimated that obesity may cost Arkansas over \$1 billion in health care costs and lost productivity annually. More than half the costs are paid by taxpayers via Medicare or Medicaid.

What has been done

The UACES offered the 15-week Reshape Yourself program in thirteen counties in FY09. Reshape Yourself supports the idea that people of all sizes and shapes can improve health by adopting healthy practices. Participants learn to plan balanced diets based on MyPyramid, balance calorie intake with calorie expenditure, read food labels, determine which foods are high in calories and fat, find enjoyable ways to be physically active and many more ideas for maintaining a healthy weight.

Results

The Reshape Yourself program experienced a 76% graduation rate. The average weight loss per graduate was 14.7 pounds. Graduates walked 18,109 miles and lost 2,418 pounds.

94% of participants reported altering behavior to follow standard serving sizes.

95% of participants decreased body weight.

83% of participants reported an increase in walking activity.

54% of participants asked about, or screened, reported decreased blood pressure.

76% of participants asked about, or screened, reported decreased blood cholesterol.

57% of participants asked about, or screened, reported decreased blood glucose.

26% of participants asked about decreasing medication reported their doctor had reduced or eliminated prescribed medication as a result of lifestyle changes made.

4. Associated Knowledge Areas

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

Outcome #9

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	68	46

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 #10

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	40	43

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 #11

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	50	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
703	Nutrition Education and Behavior
724	Healthy Lifestyle

Outcome #12

1. Outcome Measures

of new food businesses started

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	9	8

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products

Outcome #13

1. Outcome Measures

of participants who indicate that they intend to adopt one or more healthy food/nutrition practices

Not Reporting on this Outcome Measure

Outcome #14

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

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

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

External funding and a change in priority programming impacted the reporting efforts for several of the programs originally designated as priorities within the Food, Nutrition and Health initiative. The economic downturn during the year impacted how programming resources were aligned; therefore, impacting the delivery of some programs. Additionally, a reduction in staff (FTEs) also had a negative impact on program delivery and reporting.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)
- Comparisons between different groups of individuals or program participants experiencing different levels of program intensity.

Evaluation Results

Instructors designing programming content utilized numerous strategies for determining the outcome and impacts of their educational programs. The types of evaluations applied to these programs are: goals-based, 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; compare programs; determine program effectiveness; prioritize funding.

Program participants in the Arthritis series engaged in physical activities to determine skill mastery. Participants reported increased knowledge, intent to adopt a new practice, and reported improvement of healthy lifestyles practices. The Strong Women program conducted Senior Fitness Tests before the first class, 12 weeks later, and then periodically after the first 12 weeks. For ongoing groups, the Senior Fitness Test is conducted at least twice a year. Evaluation outcomes revealed that 40,840 individuals participated and of those surveyed, 65% improved upper body strength, 65% improved lower body strength, 60% improved balance, 59% improved upper body flexibility, and 58% increased aerobic endurance.

Weigh-ins are conducted before and after program completion to determine weight loss and increases in physical activity during and following the Reshape Yourself program. In FY2009 219 Reshape Yourself participants enrolled in the multi-session program. Of the 219 participants 166 completed the program, for a graduation rate of 76%. The average weight loss for each graduate was 14.5 pounds. Data from the program indicates that graduates: walked 18,109 miles; altered behavior by following standard serving sizes (94%); lost a total of 2,418 pounds. Health Screenings were also used to determine behavioral changes and differences within physiologically-related measurement levels (e.g.; blood pressure levels, blood glucose levels, cholesterol levels).

172 4-H Journals were rated by a team of reviewers. A panel of judges was utilized to evaluate each journal entry on the caliber of the activities and educational programming the young person recorded. Participants must exhibit an increase in knowledge, a change in behavior, skills enhancement, and contribution to the community. Scholarships are offered to senior 4-H'ers who are journal winners.

Explanation for Evaluation Variances

State Outputs:

Data for #3, 4, 5- Moved to Food Safety Planned Program

Data for # 6, 7- Moved to Childhood Obesity Planned Program

Pertinent data extracted from Outputs #11-12 and #14 and utilized in Childhood Obesity, Food Safety and/or Global Food Security and Hunger Planned Programs.

State Outcomes:

Outcomes # 1,2,4,7,13- Pertinent data extracted from various outcomes to use in new areas of focus (i.e.; Food Safety, Childhood Obesity, Global Security and Hunger)

Outcome #3- A shift in program emphasis to Science Technology, Engineering and Math

Outcome #5- Economic downturn impacted number of entrepreneurs involved

Outcome #6- Increased focus on publishing

Outcome#8- Reduction in county FTEs and number of programs offered.

Outcomes #14 and #15- Data not collected

Key Items of Evaluation

Outcome data from key programs reveal the following impacts:

Arthritis Initiative

1399 participant contacts, of those surveyed:

91% (42 of 46) of individuals increased knowledge as a result of the Arthritis program.

82% (27 of 33) of individuals intend to adopt a new practice following the Arthritis program.

43% (6 of 14) of individuals reported improvement of healthy lifestyle practices as a result of the Arthritis program.

Health (Medwise Arkansas)

After polling 37 participants as to how they store their medicines, only 2 out of 37 (5%) kept their medicine locked up. On the other hand, 22/37 or (59%) kept their medicine in plain site in the kitchen. The others stores them in their bedroom or bathroom - both unsafe storage places for medicine. This practice raises the risk of being a victim of theft since prescription drug abuse is a leading problem in the state of Arkansas. Our classes address how to safely secure, monitor and

dispose of medicine properly.

Acknowledging Aging

247 participant contacts, of those surveyed:

267 individuals gained knowledge of age related physical changes and disease processes.

225 gained knowledge of the myths of aging.

Reshape Yourself

Of participants who were asked about changes in medication, 26% reported their doctor had reduced or eliminated prescribed medication as a result of lifestyle changes made.

Of participants who were asked about or screened for blood pressure, cholesterol and glucose:

54% decreased blood pressure

76% decreased blood cholesterol

57% decreased blood glucose

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Natural Resources & Environment

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	5%		5%	
102	Soil, Plant, Water, Nutrient Relationships	5%		5%	
111	Conservation and Efficient Use of Water	10%		10%	
112	Watershed Protection and Management	15%		15%	
122	Management and Control of Forest and Range Fires	5%		5%	
123	Management and Sustainability of Forest Resources	25%		25%	
124	Urban Forestry	5%		5%	
133	Pollution Prevention and Mitigation	10%		10%	
135	Aquatic and Terrestrial Wildlife	15%		15%	
605	Natural Resource and Environmental Economics	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	14.9	0.0	21.7	0.0
Actual	16.4	0.0	11.3	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
284914	0	161375	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
231488	0	165601	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1643873	0	4963143	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

4-H Rice for Ducks programs
Arkansas Acres for Wildlife program
Develop educational materials, curriculum, & resources
Geographic Information Systems (GIS) and Geographic Positioning Systems (GPS) training
Site visits, one-on-one consultations
Workshops
Field days
Farm visits
Demonstrations
Educational meetings
News articles
Newsletter
Web-based education
Continuing education

2. Brief description of the target audience

4-H Club Youth
Agri business
Row Crop Agricultural Producer Organizations
Row Crop agricultural producers
Certified crop advisors
Conservation District Directors
Consultants
Forest landowner groups
Forest industry
Loggers
Natural resource professionals
Landowners
Homeowners
Educators
State & federal agency personnel
Watershed organizations
Wildlife organizations
Private nutrient applicator
Commercial nutrient applicator
Livestock producers
Livestock industry personnel
Livestock producer organizations
General public
Researchers
Policy makers
Youth
Extension faculty & staff
Teaching faculty
Research funding personnel and agencies

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	5000	5000	2500	2500
Actual	30358	86281	3509	135

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

Patent Applications Submitted

Year: 2009
 Plan: 0
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	7	12	
Actual	8	12	20

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of programs held for professional natural resource managers

Year	Target	Actual
2009	20	6

Output #2

Output Measure

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

Year	Target	Actual
2009	45	78

Output #3

Output Measure

- Number of Natural Resource Field Demonstrations

Year	Target	Actual
2009	30	27

Output #4**Output Measure**

- Number of Natural Resource Field Days

Year	Target	Actual
2009	10	7

Output #5**Output Measure**

- Total Number of Natural Resources contacts through all programs and activities

Year	Target	Actual
2009	8000	30356

Output #6**Output Measure**

- Total Number of Natural Resources programs and events

Year	Target	Actual
2009	117	140

Output #7**Output Measure**

- Number of Acres enrolled in Arkansas Acres for Wildlife

Year	Target	Actual
2009	1700200	714492

Output #8**Output Measure**

- Number of Educational Materials & Curriculum developed and/or delivered

Year	Target	Actual
2009	10	20

Output #9**Output Measure**

- Number of Natural Resource Newsletters

Year	Target	Actual
2009	2	3

Output #10**Output Measure**

- Web-Based Education: Number of web modules, sites

Year	Target	Actual
2009	3	3

Output #11

Output Measure

- Number of education programs on urban stormwater management

Year	Target	Actual
2009	40	47

Output #12

Output Measure

- Number of participants in urban stormwater management programs

Year	Target	Actual
2009	500	1431

Output #13

Output Measure

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

Year	Target	Actual
2009	20	28

Output #14

Output Measure

- Number of natural resources/environmental events for livestock producers

Year	Target	Actual
2009	20	28

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 natural resource management
2	Number of acres impacted by Natural Resources & Environmental educational efforts (including Acres for Wildlife)
3	Number of clientele who adopt Best Management Practices in Natural Resource management that protect and enhance water quality
4	Number of Landowners who adopt wildlife management practices that enhance wildlife habitat or prevent & control wildlife damage to property
5	Number of registered foresters maintaining CFEs
6	Number of participants indicating an increased understanding of stormwater issues

Outcome #1**1. Outcome Measures**

Number of landowners indicating an increased understanding of natural resource management

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	400	2000

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Arkansas has 18.4 million acres of timberland which produces between 20 and 25 million tons of industrial roundwood each year. Ten years ago, significant portions of this timberland was owned by forest industry, which also had significant resources and expertise to manage and protect this forest. Over the past five years, nearly all industrial forest land in Arkansas has been transferred to non-industrial private owners. Forest land ownership is becoming more fragmented and the new owners often are focused on short-term economic returns or the development of this forest land into permanent non-forest uses. At the same time, the demand for timber, clean water, biodiversity, and biomass for renewable fuels is likely to place greater demands on Arkansas' forest lands in the near future.

What has been done

The use of existing research and demonstration plots, as well as continued development of new projects on field stations located around the state, are used to support workshops, seminars, and field days. The University of Arkansas cooperates with other forestry organizations in conducting landowner education programs, and whenever possible, before and after surveys of landowner knowledge regarding new technologies, new markets, and new management techniques are conducted.

Results

Under the outcome target of natural resource management, landowners have indicated increased awareness of soil and water conservation practices, and how to obtain the best benefit to cost ratios for management inputs of water (irrigation), herbicides, and fertilizers on their forest land. As industrial fire-fighting capacity has been reduced though changes in land ownership, landowner awareness regarding fire management and prevention techniques has been a priority of several workshops conducted in cooperation with the Arkansas Forestry Commission. As the Wildland Urban Interface (WUI) continues to grow in Arkansas through expanded development of forest lands, landowner education is turning also towards suburban landowners, educating them in protecting their home from wildfire dangers, dealing with nuisance wildlife, and reducing their negative impact on water resources through proper use and disposal of household chemicals.

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
- 133 Pollution Prevention and Mitigation
- 135 Aquatic and Terrestrial Wildlife
- 605 Natural Resource and Environmental Economics

Outcome #2

1. Outcome Measures

Number of acres impacted by Natural Resources & Environmental educational efforts (including Acres for Wildlife)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1054000	770380

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Natural resource management, water quality and quantity, alternative energy, professional development, pollution mitigation and prevention are all key issue facing Arkansans. Providing households, nutrient applicators, landowners, farmers, and natural resource professionals the tools and knowledge necessary to implement sustainable natural resource management is the goal of this program. An estimate of the acres actually impacted by our efforts helps stakeholders and the agency gage success.

What has been done

Various programs fall under the Natural Resource and Environment umbrella and are delivered at county, state and regional levels. County agents and University faculty held over 400 natural resource education meetings, short-courses, workshops, field days, and demonstrations for households, landowners, farmers, natural resource professionals, and other stakeholders. Topics included wildlife habitat restoration, hardwood and pine management, wildlife food plots, nutrient management, GIS/GPS applications, and storm water management.

Results

In 2009, 3,359 landowners and farmers enrolled over 1,240,157 acres in the Acres for Wildlife Program, a cooperative program between the Arkansas Game and Fish Commission and the UA Cooperative Extension Service. The objective of the program is to improve wildlife habitat on private land through establishing food plots and encouraging management plants. Of the landowners enrolled in Acres for Wildlife, 298 cooperators requested and received information about developing wildlife management plans. Landowner Education: 40

different workshops, field days, conferences, and meetings were held in Arkansas in 2008. Over 2,000 individuals including foresters, land managers, and landowners attended these events.

Although the acreage impacted is unknown, over 200 commercial and private nutrient applicators were trained regarding pollution prevention and water quality protection in 2008. Twenty-five livestock operators managing over 1,500 acres learned to minimize their impact on water quality as a result.

Thirty-one MS4 jurisdictions in Arkansas participated, identified as Phase II areas (including 48 cities/towns and 13 unincorporated areas in 13 counties) were educated about storm water runoff mitigation, illicit discharge detection and elimination, runoff control, and pollution prevention.

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
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
605	Natural Resource and Environmental Economics

Outcome #3

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	250	168

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Eastern Arkansas has hundreds of stream miles 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 and interest in Northern and

Western Arkansas. It has prompted new state nutrient management regulations, two federal lawsuits against the poultry industry and an increased concern to poultry producers over the long-term sustainability of their livelihood.

What has been done

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

Results

As a result of our research and educational efforts, we assume that row crop producers are implementing BMPs to reduce pollutant loads from crop production in the Mississippi Delta of Arkansas. And that livestock producers are implementing BMPs to reduce pollutant loads from pastures treated with poultry litter in the Ozark Highlands region of Arkansas. With regard to nutrient management, we have trained over 140 nutrient management planners and over 2700 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
123	Management and Sustainability of Forest Resources
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife

Outcome #4

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	2000	141

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Private landowners account for approximately 80% of the landholdings in Arkansas. Their actions on the landscape directly affect wildlife populations. Those who adopt wildlife management practices will help not only high visibility species such as white-tailed deer and wild turkey, but also species of concern such as northern bobwhite, spotted skunk, and 300+ lesser known species described in the state wildlife action plan. Reducing conflicts with wildlife will result in a win-win outcome for both landowners and wildlife. The economic costs can be substantial to individuals experiencing property damage and health issues from encountering wildlife. For example, hiring a professional to remove a bat colony from a home can cost \$3,000 to \$10,000 or more.

What has been done

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

Results

The reported actual quantitative outcome of 386 is conservative given numerous public contacts through a variety of methods, many of which are difficult to document changes in behavior. The actual outcome represents those clients who county agents followed up and reported adoption of a practice to improve wildlife habitat or prevent wildlife damage. County agents also collected evaluations from meeting participants and asked their intention to adopt practices which improve wildlife or prevent wildlife damage. When feasible, landowners can benefit financially by preventing or controlling wildlife damage themselves instead of hiring a nuisance wildlife control operator. We provide research-based information and legal aspects of encounters with nuisance wildlife species such as snakes, skunks, deer, armadillos, moles, gophers, bats, and bears.

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
122	Management and Control of Forest and Range Fires
123	Management and Sustainability of Forest Resources
124	Urban Forestry
135	Aquatic and Terrestrial Wildlife
605	Natural Resource and Environmental Economics

Outcome #5

1. Outcome Measures

Number of registered foresters maintaining CFEs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	600	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 500 Registered Foresters. Each must complete 6 hours of Continuing Education a year to remain registered. The Forestry Continuing Education program works to fulfill these educational requirements of foresters in particular and all other professionals in general.

What has been done

Input into the Forestry Continuing Education program is derived directly from the Continuing Education advisory board comprised of registered foresters, University faculty, private forest landowners, and other natural resource professionals. Input is also received from the Arkansas Forest Resources Center advisory board, county agents, Arkansas Forestry Commission, and other partner agencies via various meeting, direct contact, and planning meetings.

Results

The Arkansas Forest Resources Center conducted 18 meetings, workshops and short courses which qualified for Continuing Forestry Education hours. These offerings provided the Registered Foresters with many opportunities to gain the continuing education hours at a number of locations and times through the year. Topics covered in the continuing education short courses include Global Information Systems applications in forestry, forest vegetation modeling, forest management, wildland urban interface issues, biofuel issues, timber taxation, and prescribed fire. Workshops are from 1 to 5 days long depending upon the course material. For example, the Prescribed Fire short-course is a five day intensive field-based course.

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
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
605	Natural Resource and Environmental Economics

Outcome #6**1. Outcome Measures**

Number of participants indicating an increased understanding of stormwater issues

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	250	396

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Clean Water Act was passed to protect the quality of surface waters in the US. In order to preserve, protect, and improve our water resources from polluted storm water runoff, the Environmental Protection Agency (EPA) requires that designated cities and counties that have "urbanized areas" implement control measures. Storm water can pick up debris, chemicals, dirt, and other pollutants, then flow into a storm sewer system and directly into a lake, stream, river, or wetland. Anything that enters a storm sewer system is discharged untreated into the waterbodies we use for swimming, fishing, and drinking water. Polluted storm water runoff can have adverse effects on plants, fish, animals, and people.

What has been done

Partnerships between the University of Arkansas Division of Agriculture Cooperative Extension Service and city and county governments in Benton, Jefferson and Washington Counties have been formed. The partnerships provide for the Cooperative Extension Service in these counties to carry out recommended control measures for the local entities affected by these regulations. These control measures include: public education and outreach; public participation and involvement; and pollution prevention and good housekeeping. The UA Division of Agriculture developed and delivers programs regarding storm water abatement that include training other professionals, youth, the public at large, municipalities, non-profit organizations, county and local government through workshops, public service announcements, fact sheets, research, demonstrations, and general educational programs.

Results

In 2009, over 1,000 people participated in 31 different educational programs aimed at increasing public awareness and understanding of storm water issues. Participants included volunteers, Master Gardeners, homeowners, and youth. In addition to educating consumers and homeowners, Municipal Separate Storm Sewer System (MS4) jurisdictions receive training and education. In 2009, 37 different MS4 jurisdictions were educated on planning and implementation of storm water management regulations. Fifteen MS4 jurisdictions utilized UA Division of Agriculture Cooperative Extension Service to conduct public outreach, education and participation programs and training for MS4 employees related to storm water management. Fact sheets, radio programs, web pages, signs, brochures, and management guides have all been developed and are available to the public. Demonstration areas highlighting the usefulness of forested riparian zones and rain gardens were also implemented or continued in 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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
124	Urban Forestry
133	Pollution Prevention and Mitigation
135	Aquatic and Terrestrial Wildlife
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

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

1. Evaluation Studies Planned

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

Evaluation Results

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

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

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

Key Items of Evaluation

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

V(A). Planned Program (Summary)**Program # 8****1. Name of the Planned Program**

Pest Management

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

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

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	30.6	0.0	2.2	0.0
Actual	23.3	0.0	1.5	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
405348	0	98304	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
329339	0	100879	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2338748	0	368170	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The University of Arkansas Division of Agriculture research program in pest management will reduce the impacts of major pests by: increasing the knowledge base on major pests, diseases, and weeds of importance to Arkansas; developing improved crop protection strategies and technologies for our major crop systems; and integrating new knowledge in plant and animal

genomics and basic science into the development new pest management strategies. Our methods will include grower meetings, training extension agents and crop consultants, educational newsletters, Extension publications, visits to individual growers /homeowners, diagnosis of pest problems, newspaper/magazine /professional journal articles, interviews, field days, web-based information, and/or applied on-farm research.

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

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

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

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

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

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

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

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

2. Brief description of the target audience

- Crop producers
- Livestock producers
- Division of Agriculture personnel
- Agricultural consultants
- Agricultural industry personnel
- Pesticide applicators
- Pest control operators
- Homeowners
- Golf course superintendents
- Commercial pest management personnel
- Master Gardeners
- Commercial landscapers
- Landscape management staff
- Public health officials
- Other researchers
- Students
- Extension Specialists
- Research funding personnel and agencies
- Policy and decision Makers
- Regulatory personnel
- State Plant Board personnel
- General public

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	70000	70000	0	0
Actual	73088	35778	208	791

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

Patent Applications Submitted

Year: 2009
 Plan: 3
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	5	45	
Actual	10	50	60

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- # of one-on-one contacts

Year	Target	Actual
2009	50000	72000

Output #2

Output Measure

- # of field demonstrations

Year	Target	Actual
2009	380	517

Output #3

Output Measure

- # of farm tours

Year	Target	Actual
2009	60	56

Output #4

Output Measure

- # of publications written

Year	Target	Actual
2009	15	47

Output #5

Output Measure

- # of farm visits made

Year	Target	Actual
2009	6000	5052

Output #6

Output Measure

- # of pesticide applicator education classes

Year	Target	Actual
2009	120	100

Output #7

Output Measure

- # of homeowner education classes

Year	Target	Actual
2009	50	36

Output #8

Output Measure

- # of hits on website

Year	Target	Actual
2009	100000	0

Output #9

Output Measure

- # of newsletters

Year	Target	Actual
2009	400	30

Output #10**Output Measure**

- # of research field days

Year	Target	Actual
2009	15	36

Output #11**Output Measure**

- # of workshops

Year	Target	Actual
2009	10	50

Output #12**Output Measure**

- # of newsletter articles

Year	Target	Actual
2009	65	257

Output #13**Output Measure**

- # of Arkansas Commodity Board grants received

Year	Target	Actual
2009	15	29

Output #14**Output Measure**

- # of federal grants and contracts

Year	Target	Actual
2009	10	1

Output #15**Output Measure**

- # of educational classes

Year	Target	Actual
2009	224	86

Output #16**Output Measure**

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

Year	Target	Actual
2009	70000	72000

Output #17

Output Measure

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

Year	Target	Actual
2009	66829	42000

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

O. No.	OUTCOME NAME
1	Refereed Journal Publications
2	# of participants intending to adopt IPM practices
3	# of participants gaining knowledge of IPM practices
4	# of participants gaining knowledge of proper pesticide application practices
5	# of participants passing commercial pesticide certification exams
6	# of producers adopting one or more IPM practices
7	# of homeowners adopting one or more IPM practices
8	# of participants adopting one or more proper pesticide application practices
9	# of diagnostic submissions
10	# of producers using computer-assisted programs
11	# of clients using scouting programs
12	# of pest monitoring traps utilized
13	Annual soybean yield - bushels per acre
14	Annual value of soybean production (1,000 Dollars)
15	Annual rice (all) yield -- pounds per acre
16	Annual value of rice (all) production (1,000 dollars)
17	Annual cotton (all) yield -- pounds per acre
18	% of soybean acreage receiving herbicide applications

19	Pounds (1,000) of herbicides applied to planted soybean acreage
20	% of soybean acreage receiving insecticide applications
21	Pounds (1,000) of insecticides applied to planted soybean acreage
22	% of soybean acreage receiving fungicide applications
23	Pounds (1,000) of fungicides applied to planted soybean acreage

Outcome #1**1. Outcome Measures**

Refereed Journal Publications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	50	60

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
312	External Parasites and Pests of Animals
721	Insects and Other Pests Affecting Humans
723	Hazards to Human Health and Safety

Outcome #2

1. Outcome Measures

of participants intending to adopt IPM practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	4000	7238

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
312	External Parasites and Pests of Animals
721	Insects and Other Pests Affecting Humans
723	Hazards to Human Health and Safety

Outcome #3

1. Outcome Measures

of participants gaining knowledge of IPM practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	4000	8408

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Rice growers understand the impacts that insects can have on plant stands and plant growth. Two such pests are the grape colaspis (lespedeza worm) and the rice water weevil, both of which are common to silt loam soils in Arkansas. Several years ago, growers used an insecticide applied to seed before planting to control both pests. Removal of that seed treatment from use resulted in less convenience for growers, less uniform stands of rice, increased damage by pests, and increased amounts of insecticide in the environment.

What has been done

UA rice entomologists assessed several new candidate seed treatments. Field studies were conducted with two active ingredients -- rynaxypyr and thiamethoxam. Small plots with natural infestations of pests were used to test ranges of rates of the seed-treated insecticides for efficacy against rice water weevil and grape colaspis. Rice water weevil larvae were controlled by both rynaxypyr and thiamethoxam up to five weeks after permanent flood or about eight to nine weeks after planting. Rynaxypyr gave good control of rice water weevils, but less control of grape colaspis larvae. In contrast, thiamethoxam controlled grape colaspis larvae and was effective against rice water weevils. In addition, thiamethoxam helped reduce numbers of early-season, piercing-sucking insects, such as aphids and chinch bugs; and rynaxypyr helped reduce numbers of armyworms and stalk borers.

Results

Our research results give rice growers information to make informed decisions about the option to use seed treatments against these two important rice pests. Growers with a history of severe stand losses can use the seed treatment that controls grape colaspis and rice water weevils. Growers with a history of severe damage to roots and yield losses from rice water weevil can use the treatment that best controls weevils and reduces damage from grape colaspis. Seed treatments should also result in less environmental impact from insecticides.

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

Outcome #4**1. Outcome Measures**

of participants gaining knowledge of proper pesticide application practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	4000	8112

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The UA pesticide collection program for unwanted pesticides applies to private farmers, growers, and producers but not commercial operations. The program is funded by a registration fee increase for pesticide registrants and there is no cost for the farmers/producers. To date, collection programs have been conducted in 34 counties and over 677,000 pounds of old, unwanted, or abandoned pesticides have been collected and disposed of properly. The initial collections were done in the Delta region of the state because of the historic, large scale farming operations in this region.

What has been done

Ten collections were made in 2009 primarily in the spring or fall to avoid the busy growing season for farmers. A significant portion of the collected pesticides have been highly toxic arsenical insecticides that are no longer labeled for use because of environmental and human safety problems.

Results

The collection and proper disposal of all the collected pesticides has ensured that these chemicals will not endanger the citizens of Arkansas nor impair our environment.

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

Outcome #5

1. Outcome Measures

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	Quantitative Target	Actual
2009	650	75

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

Outcome #6

1. Outcome Measures

of producers adopting one or more IPM practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	4000	6236

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Arkansas grows about 9,000 acres of sod each year and has approximately 58 sod producers. The majority of grass sod in Arkansas is grown within the area designated as quarantined due to infestation by imported fire ants. Because of the quarantine, sod producers are required to treat sod -- at a considerable cost -- before shipment into non-infested counties or out of state. Insecticide options for fire ant quarantine treatment are very limited, expensive and often require long exposure periods. Registration of chlorpyrifos as a fire ant quarantine treatment option in commercial sod production has been withdrawn. The one remaining option for this use is fipronil, which is expensive and requires a long exposure period. However, the conditional registration for use of fipronil on sod and turf expired and the product may not be re-registered. The potential loss of this one option for Arkansas sod producers requires discovering and testing other options.

What has been done

We continued studies to identify alternative treatment options for fire ants that infest commercial sod. The objectives were to find more economical and practical insecticide options for commercial sod producers to use to meet federal and state requirements to ship sod from quarantined areas. Our results identified bifenthrin as an acceptable quarantine treatment. We also found that treatments that combined baits and bifenthrin may also be suitable. The combination treatment would be less expensive than treatment with bifenthrin alone and would result in a shorter exposure period, thus providing a better option for Arkansas sod producers.

Results

Our study results were used by the Arkansas State Plant Board to approve use of bifenthrin as an option for within-state quarantine treatment of sod before shipment into non-quarantined areas. The cost of the bifenthrin treatment saves growers approximately \$500 per acre versus the current insecticide option, and will help stop the spread of fire ants into non-quarantined areas.

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

Outcome #7**1. Outcome Measures**

of homeowners adopting one or more IPM practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	250	397

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

Outcome #8**1. Outcome Measures**

of participants adopting one or more proper pesticide application practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1200	5332

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

Outcome #9

1. Outcome Measures

of diagnostic submissions

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	780	1750

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
312	External Parasites and Pests of Animals
721	Insects and Other Pests Affecting Humans

Outcome #10

1. Outcome Measures

of producers using computer-assisted programs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	650	643

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
312	External Parasites and Pests of Animals
721	Insects and Other Pests Affecting Humans

Outcome #11**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	Quantitative Target	Actual
2009	750	2664

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The Arkansas IPM Program provides scouting schools and workshops developed from needs expressed by growers to county agents; the scouting schools are organized by county agents, with training provided by Extension IPM Faculty members. Scouting schools are held on grower's land, to illustrate "real-world" pest management issues to crop scouts, consultants and growers.

What has been done

In 2009, our documented IPM activities included these scouting schools:

-10 multi-county soybean scouting schools, with a total of ~ 400 growers, scouts and consultants participating.

These schools were held in conjunction with weed field days. A total of 200 sweep nets were distributed (and their proper use demonstrated) to improve insect scouting and assist in decision making.

-3 multi-county rice scouting schools, with a total of 60 crop consultants participating.

-2 multi-county cotton scouting schools, with 80 participants (8 growers, 72 scouts).

Each scouting school provided: 1) identification, prevention and control of diseases (e.g., soybean rust), and cultural practices (e.g., varieties and planting dates) to minimize disease incidence and pressures; 2) weed identification, control methods and cultural tactics to help manage herbicide resistance (e.g., by pigweeds); 3) insect identification and sampling methods, practices to minimize need for and use of insecticides, managing insect resistance to Bt and new emerging pest species.

Results

Outcomes from the scouting schools include increased numbers of trained scouts, who provide scouting service to growers and other clientele.

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
312	External Parasites and Pests of Animals
721	Insects and Other Pests Affecting Humans

Outcome #12**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	Quantitative Target	Actual
2009	220	650

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The pecan nut casebearer, *Acrobasis nuxvorella*, is a key pest of commercial pecan across the U.S. Pecan Belt. Population levels in Arkansas probably vary from annual, large infestations in southwestern Arkansas to rare, small infestations in northeastern Arkansas; however, accurate data is lacking. Effective pheromone traps systems have been developed over the past decade to effectively predict activity of the first spring generation of moths and time insecticide sprays to protect the small nutlets in May and June from larval entry and nut loss. The first generation is the most damaging as a single larva can cause the loss of an entire cluster of the small nutlets.

What has been done

Prior to spring emergence of pecan nut casebearer adults, commercial orchards and native groves of pecan were sampled for the presence of overwintering hibernacula. Hibernacula are small structures of insect silk and plant parts that serve as an overwintering site for larvae from the last generation of the previous year. A network of 139 pheromone traps was established across Arkansas, including sites in Little River, Miller, Chicot, Conway, Pulaski, Phillips, White, Johnson, and Washington counties. Traps were checked for pecan nut casebearer activity at least three times per week during May and June. Observations were made by cooperating extension agents and growers. Data was reported via telephone answering system to a Division of Agriculture laboratory at the University of Arkansas. A website was created to update the Arkansas growers about moth activity and need for insecticide sprays, and all work was coordinated with an ipmPIPE project across the U.S. Pecan Belt.

Results

Hibernacula were observed in both managed orchards and native groves, indicating that this overwintering stage of the insect may be a good indicator of resident populations across the state. Results from the pheromone traps showed densities of moths in southwestern Arkansas were very high and confirmed pecan nut casebearer populations along the Arkansas River in central Arkansas. Results allowed growers to make informed decisions about when and whether to treat the pecan trees to prevent losses.

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
312	External Parasites and Pests of Animals
721	Insects and Other Pests Affecting Humans
723	Hazards to Human Health and Safety

Outcome #13

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	Quantitative Target	Actual
2009	38	38

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
403	Waste Disposal, Recycling, and Reuse

Outcome #14

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	Quantitative Target	Actual
2009	791094	1263038

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
403	Waste Disposal, Recycling, and Reuse

Outcome #15

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	Quantitative Target	Actual
2009	6610	6800

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
403	Waste Disposal, Recycling, and Reuse

Outcome #16

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	Quantitative Target	Actual
2009	740648	1473879

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #17**1. Outcome Measures**

Annual cotton (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	Quantitative Target	Actual
2009	916	797

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Cotton is the most important agronomic crop in the southern U.S. with an estimated annual value of approximately \$6 billion. The estimated monetary loss to cotton farmers in Arkansas last year to diseases was slightly over \$300 million, and a major proportion of this loss was due to nematodes and seedling diseases.

What has been done

Statewide, growers treat about 200,000 acres annually for nematodes; therefore, use of precision agriculture technologies for treating nematodes can lead to a potential 30% reduction in pesticide use.

Results

Use of technology to make informed decisions about treating with nematicides and fungicides on 200,000 acres results in about \$2.2 million in direct savings to producers.

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
403	Waste Disposal, Recycling, and Reuse

Outcome #18

1. Outcome Measures

% of soybean acreage receiving herbicide applications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	95	98

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
403	Waste Disposal, Recycling, and Reuse

Outcome #19

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	4152	7500

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
403	Waste Disposal, Recycling, and Reuse

Outcome #20

1. Outcome Measures

% of soybean acreage receiving insecticide applications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	14	79

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

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

Outcome #21

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	344	586

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
403	Waste Disposal, Recycling, and Reuse

Outcome #22

1. Outcome Measures

% of soybean acreage receiving fungicide applications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	8	60

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
403	Waste Disposal, Recycling, and Reuse

Outcome #23

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	21	199

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
403	Waste Disposal, Recycling, and Reuse

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
- Other (NASS)

Brief Explanation

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

1. Evaluation Studies Planned

- After Only (post program)
- During (during program)
- Other (NASS)

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)**Program # 9****1. Name of the Planned Program**

Plants & Plant Products

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

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

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	69.6	0.0	35.5	0.0
Actual	26.0	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
452146	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
367361	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2608756	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Develop and conduct workshops, educational meetings, demonstrations, and field days.
- Direct clientele contact: on- site visits, phone calls, mail, and emails.
- Develop and produce educational products and materials.
- Conduct tours and demonstrations.
- 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
 Students
 Extension Specialists
 Teaching faculty
 Research funding personnel and agencies
 Public

V(E). Planned Program (Outputs)**1. Standard output measures**

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	201000	430000	0	0
Actual	217225	98523	3821	0

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

Year: 2009
 Plan: 10
 Actual: 10

Patents listed

Prime-ARK R-45 Blackberry
 White Cloud Peach
 White Diamond Peach
 Natchez Blackberry
 Taggart Rice
 Templeton Rice
 CL141-AR Rice
 CL181-AR Rice
 Herbicide 5-ketocloromazone Acid
 N-STAR soil test

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	0	100	
Actual	2	79	81

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

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

Year	Target	Actual
2009	245	13

Output #2

Output Measure

- # of production education meetings that address fertilizer, soil and water management

Year	Target	Actual
2009	30	13

Output #3

Output Measure

- # of production education meetings that address variety selection

Year	Target	Actual
2009	21	14

Output #4

Output Measure

- # of production education meetings that address plant monitoring and nutrition

Year	Target	Actual
2009	15	55

Output #5**Output Measure**

- # of production meetings that address soil and water testing

Year	Target	Actual
2009	12	13

Output #6**Output Measure**

- # of production education meetings that address variety/hybrid selection consultations

Year	Target	Actual
2009	39	14

Output #7**Output Measure**

- # of demonstrations/on-farm research

Year	Target	Actual
2009	190	45

Output #8**Output Measure**

- # of farm visits

Year	Target	Actual
2009	364	87

Output #9**Output Measure**

- # of field days

Year	Target	Actual
2009	51	2

Output #10**Output Measure**

- # of informal surveys of participants to measure culture practices

Year	Target	Actual
2009	20	42

Output #11**Output Measure**

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

Year	Target	Actual
2009	600	500

Output #12**Output Measure**

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

Year	Target	Actual
2009	2500	2704

Output #13**Output Measure**

- # of hits to plant and plant products web-based educational material

Year	Target	Actual
2009	7000	3500

Output #14**Output Measure**

- # of Arkansas Commodity Board Grants received

Year	Target	Actual
2009	50	10

Output #15**Output Measure**

- # of federal grants and contracts

Year	Target	Actual
2009	25	4

Output #16**Output Measure**

- # of Plants & Plant Products clientele contacts from education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational methods

Year	Target	Actual
2009	195500	42833

Output #17

Output Measure

- # of Plants & Plant Products education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational events

Year	Target	Actual
2009	4064	1362

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content	
O. No.	OUTCOME NAME
1	# of commercial forage producers who gained knowledge related to management technology
2	# of commercial forage producers who gained knowledge related to production practices
3	# of new Master Gardeners trained and certified
4	# of participants who changed or adopted a new commercial forage management practice
5	# of participants who changed or adopted a new forage and/or grazing management practice
6	# of clientele who select improved varieties
7	# of clientele using soil testing
8	# of clientele using plant testing
9	# of clientele using water testing
10	# of impacted acres using soil testing
11	# of impacted acres using plant testing
12	# of impacted acres using water testing
13	# Forage testing submissions
14	# of producers using strip-grazing for their stockpiled forages
15	# of clientele (non-duplicated) who use the DD50 program for improved production efficiency
16	# of impacted acres using the DD50 program for improved production efficiency
17	# of clientele using RICESEED program
18	# of acres planted based on output from RICESEED program

O. No.	OUTCOME NAME
1	# of commercial forage producers who gained knowledge related to management technology
2	# of commercial forage producers who gained knowledge related to production practices
3	# of new Master Gardeners trained and certified
4	# of participants who changed or adopted a new commercial forage management practice
5	# of participants who changed or adopted a new forage and/or grazing management practice
6	# of clientele who select improved varieties
7	# of clientele using soil testing
8	# of clientele using plant testing
9	# of clientele using water testing
10	# of impacted acres using soil testing
11	# of impacted acres using plant testing
12	# of impacted acres using water testing
13	# Forage testing submissions
14	# of producers using strip-grazing for their stockpiled forages
15	# of clientele (non-duplicated) who use the DD50 program for improved production efficiency
16	# of impacted acres using the DD50 program for improved production efficiency
17	# of clientele using RICESEED program
18	# of acres planted based on output from RICESEED program

19	# of Master Gardeners who recertified
20	# of new horticultural businesses and new farmers markets
21	Acres of harvested wheat (all)
22	Yield (bushels) of harvested wheat (all)
23	Value of production of harvested wheat (all)
24	Acres of harvested soybeans (all)
25	Yield (bushels) of harvested soybeans
26	Value of production of harvested soybeans (all)
27	Acres of harvested rice (all)
28	Yield (pounds) of harvested rice (all)
29	Acres of harvested cotton (all)
30	Yield (pounds) of harvested cotton (all)
31	Total production (bales) of harvested cotton (all)
32	Acres harvested of hay (all)
33	Yield (tons)of harvested hay (all)
34	Value of production of harvested hay (all)

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	Quantitative Target	Actual
2009	200	898

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 commercial forage producers who gained knowledge related to production practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	200	121

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 #3

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	Quantitative Target	Actual
2009	700	490

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
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 participants who changed or adopted a new commercial forage management practice

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	60	298

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 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	Quantitative Target	Actual
2009	500	3268

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 #6**1. Outcome Measures**

of clientele who select improved varieties

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	9950	588

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

State Cotton Variety Trials have been conducted over several decades in approximately 15 states. Results are published and routinely made available in hard copy. On-line delivery of data is a more recently developed tool made available to growers. However, comparison of data from different states is still very difficult because varieties vary among test sites and are usually sorted by relative yield at a location. In addition, variety names often cause much confusion because they may be tested as an experimental number then later changed to a commercial name. Growers need a more user friendly and customized delivery approach to allow comparisons to be made.

What has been done

A computer program, named COTVAR, was developed and subsequently released in 2007. Using COTVAR, users can easily compare performance of cotton varieties in state variety tests. At present, the program utilizes data from state variety tests in Arkansas, Louisiana, Mississippi, Missouri, and Tennessee. Each year, cotton varieties are evaluated at approximately 30 sites over these five states. Data and programming is now underway to expand COTVAR to include all states that conduct cotton variety tests. The revised program is expected to be available on-line early in 2010. With the revised program, the user will initially choose one of three testing zones (east, central or west). Each zone will then run as the current COTVAR program now runs. Users can select specific test sites within a zone (based on GPS coordinates, irrigation, and/or soil type) or regions, then compare varieties, which are characterized by type (convention, single or stacked transgenes) and by status (commercially available, experimental, or obsolete). Data generated include yield, lint fraction, and fiber properties. The COTVAR program was written by Chalmers Davis and Becky Bridges, University of Arkansas Cooperative Extension Service, and is available on line at <http://cotvar.uaex.edu/intro.asp>. The revised program with zones will be available at the same site.

Results

Other than technology fees, planting seed costs of different cotton variety does not vary greatly. However, yields of varieties may differ greatly in specific environments. Therefore, selecting the variety that will most likely perform best is essentially a no cost decision that can provide great returns for the cotton grower. The COTVAR program will assist producers to make informed choices with regard to variety selection.

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
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
206	Basic Plant Biology
213	Weeds Affecting Plants

Outcome #7

1. Outcome Measures

of clientele using soil testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	8760	403

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
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #8

1. Outcome Measures

of clientele using plant testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	655	134

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
205	Plant Management Systems
206	Basic Plant Biology
213	Weeds Affecting Plants

Outcome #9

1. Outcome Measures

of clientele using water testing

Not Reporting on this Outcome Measure

Outcome #10**1. Outcome Measures**

of impacted acres using soil testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	30200000	123396

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The Ozark Highlands, particularly northwest Arkansas, is one of several regions in the United States with concentrated broiler production. In Arkansas alone, over 1.2 billion broilers are raised annually, which also generates ~ 1.7 million Mg of broiler waste (i.e., litter) every year. Broiler litter is typically land-applied to surrounding pastures as a means of recycling the litter as an organic fertilizer. However, broiler litter also contains numerous heavy metals, specifically arsenic (As). Adsorption to soil particles is a primary means of As retention in soil that limits As mobility and the potential threat of water contamination. However, As also competes with phosphorus (P) for adsorption sites. Therefore, it is essential to understand how broiler-litter-derived As behaves in a high-soil-test-P environment, which characterizes many of the pastures of northwest Arkansas and the Ozark Highlands.

What has been done

To address this issue, a laboratory adsorption study was conducted to evaluate the effects of a history of broiler litter application rates (i.e., 0, 5.6, and 11.2 Mg litter ha⁻¹) and soil depth [0-20 and 20-50 cm representing a high organic matter (OM)/low clay and low OM/high clay combination, respectively] on As adsorption to soil and to evaluate the effects of the presence of added P on As adsorption to soil. Soil samples were obtained for actual field plots which had been amended with the above-stated litter rates for four consecutive years. A series of nine As concentrations ranging from 0 to 25 mg L⁻¹ with and without constant P (~3 mg L⁻¹) were added to 1 g of air-dried soil collected from field plots representing each of the treatment combinations and were allowed to equilibrate on an end-over-end shaker for 24 hrs.

Results

Results showed that As adsorption was greater to the soil of the unamended control than to the soil of the low (5.6 Mg ha⁻¹) and high (11.2 Mg ha⁻¹) litter treatments and As adsorption was also greater in the 20- to 50-cm depth than in the 0- to 20-cm depth whether additional P was present or not. However, As adsorption in the presence of constant P was nearly twice that when only As was present indicating that, under these experimental conditions, As and P were likely co-precipitated out of solution to appear as if increased adsorption was occurring.

Nonetheless, these results suggest that there may be less of a potential to increase As mobility in the soil when broiler litter is land-applied containing both As and P; thus the potential threat to groundwater contamination from increased As leaching may also be less than once thought.

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

Outcome #11

1. Outcome Measures

of impacted acres using plant testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	147000	3778

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
205	Plant Management Systems
206	Basic Plant Biology
213	Weeds Affecting Plants

Outcome #12

1. Outcome Measures

of impacted acres using water testing

Not Reporting on this Outcome Measure

Outcome #13

1. Outcome Measures

Forage testing submissions

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	75	541

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

Outcome #14

1. Outcome Measures

of producers using strip-grazing for their stockpiled forages

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	22	108

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

Outcome #15

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #16

1. Outcome Measures

of impacted acres using the DD50 program for improved production efficiency

Not Reporting on this Outcome Measure

Outcome #17

1. Outcome Measures

of clientele using RICESEED program

Not Reporting on this Outcome Measure

Outcome #18

1. Outcome Measures

of acres planted based on output from RICESEED program

Not Reporting on this Outcome Measure

Outcome #19

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	Quantitative Target	Actual
2009	500	2954

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 #20

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	Quantitative Target	Actual
2009	2	18

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

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 #21

1. Outcome Measures

Acres of harvested wheat (all)

Not Reporting on this Outcome Measure

Outcome #22

1. Outcome Measures

Yield (bushels) of harvested wheat (all)

Not Reporting on this Outcome Measure

Outcome #23

1. Outcome Measures

Value of production of harvested wheat (all)

Not Reporting on this Outcome Measure

Outcome #24

1. Outcome Measures

Acres of harvested soybeans (all)

Not Reporting on this Outcome Measure

Outcome #25

1. Outcome Measures

Yield (bushels) of harvested soybeans

Not Reporting on this Outcome Measure

Outcome #26

1. Outcome Measures

Value of production of harvested soybeans (all)

Not Reporting on this Outcome Measure

Outcome #27

1. Outcome Measures

Acres of harvested rice (all)

Not Reporting on this Outcome Measure

Outcome #28

1. Outcome Measures

Yield (pounds) of harvested rice (all)

Not Reporting on this Outcome Measure

Outcome #29

1. Outcome Measures

Acres of harvested cotton (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	945000	500000

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
- 206 Basic Plant Biology
- 213 Weeds Affecting Plants

Outcome #30

1. Outcome Measures

Yield (pounds) of harvested cotton (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	916	797

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #31

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	Quantitative Target	Actual
2009	1804000	830000

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

State Cotton Variety Trials have been conducted over several decades in approximately 15 states. Results are published and routinely made available in hard copy. On-line delivery of data is a more recently developed tool made available to growers. However, comparison of data from different states is still very difficult because varieties vary among test sites and are usually sorted by relative yield at a location. In addition, variety names often cause much confusion because they may be tested as an experimental number then later changed to a commercial name. Growers need a more user friendly and customized delivery approach to allow comparisons to be made.

What has been done

A computer program, named COTVAR, was developed and subsequently released in 2007. Using COTVAR, users can easily compare performance of cotton varieties in state variety tests. At present, the program utilizes data from state variety tests in Arkansas, Louisiana, Mississippi, Missouri, and Tennessee. Each year, cotton varieties are evaluated at approximately 30 sites over these five states. Data and programming is now underway to expand COTVAR to include all states that conduct cotton variety tests. The revised program is expected to be available on-line early in 2010. With the revised program, the user will initially choose one of three testing zones (east, central or west). Each zone will then run as the current COTVAR program now runs. Users can select specific test sites within a zone (based on GPS coordinates, irrigation, and/or soil type) or regions, then compare varieties, which are characterized by type (convention, single or stacked transgenes) and by status (commercially available, experimental, or obsolete). Data generated include yield, lint fraction, and fiber properties.

Results

The COTVAR program was written by Chalmers Davis and Becky Bridges, University of Arkansas Cooperative Extension Service, and is available on line at <http://cotvar.uaex.edu/intro.asp>. The revised program with zones will be available at the same site. Other than technology fees, planting seed costs of different cotton variety does not vary greatly. However, yields of varieties may differ greatly in specific environments. Therefore, selecting the variety that will most likely perform best is essentially a no cost decision that can provide great returns for the cotton grower. The COTVAR program will assist producers to make informed choices with regard to variety selection.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #32**1. Outcome Measures**

Acres harvested of hay (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1340000	1337000

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 #33

1. Outcome Measures

Yield (tons)of harvested hay (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

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

2009 2 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
205	Plant Management Systems

Outcome #34

1. Outcome Measures

Value of production of harvested hay (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	148631000	70

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

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

Program outcomes will be influenced by market conditions including the fuel versus food pressure, changes in payments to farmers, land grant university funding, the downturn in the economy, and as always weather conditions. Any or all of these factors could cause projected outcomes to vary widely.

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

1. Evaluation Studies Planned

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

Evaluation Results

Comprehensive program and departmental evaluation reviews for research, extension, and teaching programs are conducted on a five to seven year cycle by various research based evaluation methods. The Department of Crop, Soil and Environmental Sciences was reviewed in February 2010. Data on shifts in production technology, acreage, cropping systems, and enrollment will be compared to historic levels and trends.

Key Items of Evaluation

V(A). Planned Program (Summary)**Program # 10****1. Name of the Planned Program**

Technology & Engineering

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
112	Watershed Protection and Management	10%		10%	
205	Plant Management Systems	10%		10%	
401	Structures, Facilities, and General Purpose Farm Supplies	10%		10%	
402	Engineering Systems and Equipment	10%		10%	
403	Waste Disposal, Recycling, and Reuse	10%		10%	
404	Instrumentation and Control Systems	5%		5%	
405	Drainage and Irrigation Systems and Facilities	10%		10%	
503	Quality Maintenance in Storing and Marketing Food Products	7%		7%	
511	New and Improved Non-Food Products and Processes	5%		5%	
512	Quality Maintenance in Storing and Marketing Non-Food Products	3%		3%	
605	Natural Resource and Environmental Economics	5%		5%	
806	Youth Development	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Plan	5.3	0.0	2.1	0.0
Actual	6.3	0.0	1.4	0.0

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

Extension		Research	
Smith-Lever 3b & 3c 109423	1890 Extension 0	Hatch 7070	Evans-Allen 0
1862 Matching 88904	1890 Matching 0	1862 Matching 7255	1890 Matching 0
1862 All Other 631343	1890 All Other 0	1862 All Other 431787	1890 All Other 0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

- Conduct field tours, work shops, educational meetings and farm visits
- Produce publications and post information to web site
- Conduct on-farm demonstrations
- Develop and release CES decision support tools
- Conduct non-duplicated 4-H Youth technology and engineering programs

2. Brief description of the target audience

- Row crop producers
- Livestock producers
- Poultry producers
- Landowners
- Consultants
- Pesticide applicators
- Agricultural agencies and businesses
- Other interested groups
- 4-H youth

V(E). Planned Program (Outputs)**1. Standard output measures**

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	3000	1200	10	5
Actual	9222	1845	97	32

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

Year: 2009

Plan: 2

Actual: 0

Patents listed**3. Publications (Standard General Output Measure)**

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan	1	3	
Actual	1	3	3

V(F). State Defined Outputs**Output Target****Output #1****Output Measure**

- # of any CES on-farm demonstrations of drainage and irrigation water management.

Year	Target	Actual
2009	20	222

Output #2**Output Measure**

- # of any CES Field Tours of drainage and irrigation water management.

Year	Target	Actual
2009	5	5

Output #3**Output Measure**

- # of any CES sponsored Educational Meetings addressing drainage and irrigation water management.

Year	Target	Actual
2009	30	16

Output #4**Output Measure**

- # Attending any CES sponsored Educational Meetings addressing drainage and irrigation water management.

Year	Target	Actual
2009	2000	399

Output #5**Output Measure**

- # of publications that include information on drainage and irrigation water management.

Year	Target	Actual
2009	5	3

Output #6**Output Measure**

- # of postings to web sites of information on drainage and irrigation water management.

Year	Target	Actual
2009	3	3

Output #7**Output Measure**

- # Attending any CES Field Tours of drainage and irrigation water management.

Year	Target	Actual
2009	100	70

Output #8**Output Measure**

- # of cooperators involved in CES on-farm demonstrations of drainage and irrigation water management.

Year	Target	Actual
2009	20	39

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

O. No.	OUTCOME NAME
1	# of people who increased their knowledge after attending any CES sponsored educational meeting, field tour or on-farm demonstration addressing drainage and irrigation water management.
2	# of people who adopted or implemented a recommendation after attending any CES sponsored educational meeting, field tour or on-farm demonstration addressing drainage and irrigation water management.
3	Acres associated with practices for improved water management

Outcome #1**1. Outcome Measures**

of people who increased their knowledge after attending any CES sponsored educational meeting, field tour or on-farm demonstration addressing drainage and irrigation water management.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	1000	1637

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities

Outcome #2**1. Outcome Measures**

of people who adopted or implemented a recommendation after attending any CES sponsored educational meeting, field tour or on-farm demonstration addressing drainage and irrigation water management.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	105	587

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)****What has been done****Results****4. Associated Knowledge Areas**

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities

Outcome #3**1. Outcome Measures**

Acres associated with practices for improved water management

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	450000	369840

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Ground water for irrigation is becoming less available in some areas of the Arkansas Delta and the cost of pumping the water is a significant part of crop production. Growers need help with irrigation water management options that can increase irrigation efficiency and reduce ground water use while decreasing irrigation pumping costs. These options include, but are not limited to: improved irrigation system design; improved irrigation scheduling and timing; adoption of surface impoundments; and tail water recovery systems.

What has been done

To help present the various options to address declining irrigation ground water supplies and increasing pumping costs, there were 5 irrigation tours, 222 on-farm demonstrations, and 16 CES sponsored meetings. In addition, both county and state level personnel responded to individual requests for information

Results

As a result of these efforts, 399 individuals attended the various group educational opportunities. When both the directed and indirect educational contacts are considered there were over 11,000 individual educational events. These contacts resulted in over 1600 individuals increasing their level of knowledge, with 587 of them implementing CES recommendations, on almost 370,000 acres.

4. Associated Knowledge Areas

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

Even under normal conditions weather will have an impact on irrigation practices. In the 2009 growing season both the significantly higher than normal rain fall and the timing of the rain fall events presented significant challenges for farmers. In addition, CES's irrigation engineer retired mid-season.

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

1. Evaluation Studies Planned

- During (during program)
- Case Study
- Comparisons between program participants (individuals, group, organizations) and non-participants

Evaluation Results

The number of contacts and most of the outputs exceeded planned targets. The outcomes of the number of individuals increasing their knowledge and adopting recommendations also exceed target levels. The outcome of number of acres associated with adopting recommendations was 82% of targeted acres.

Key Items of Evaluation

Measures of the number of individuals increasing their knowledge, the number of individuals adopting recommendations, and the number of acres associated with the adopted recommendations.

V(A). Planned Program (Summary)

Program # 11

1. Name of the Planned Program

Global Food Security and Hunger

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
102	Soil, Plant, Water, Nutrient Relationships	5%		5%	
111	Conservation and Efficient Use of Water	5%		5%	
112	Watershed Protection and Management	5%		5%	
201	Plant Genome, Genetics, and Genetic Mechanisms	5%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	5%		5%	
204	Plant Product Quality and Utility (Preharvest)	5%		5%	
205	Plant Management Systems	5%		5%	
213	Weeds Affecting Plants	5%		5%	
215	Biological Control of Pests Affecting Plants	5%		5%	
301	Reproductive Performance of Animals	5%		5%	
302	Nutrient Utilization in Animals	5%		5%	
303	Genetic Improvement of Animals	5%		5%	
305	Animal Physiological Processes	5%		5%	
306	Environmental Stress in Animals	5%		5%	
307	Animal Management Systems	5%		5%	
308	Improved Animal Products (Before Harvest)	5%		5%	
311	Animal Diseases	5%		5%	
703	Nutrition Education and Behavior	5%		5%	
704	Nutrition and Hunger in the Population	5%		5%	
724	Healthy Lifestyle	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	55.8	0.0	73.6	0.0

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

Extension		Research	
Smith-Lever 3b & 3c 971046	1890 Extension 0	Hatch 2721471	Evans-Allen 0
1862 Matching 788959	1890 Matching 0	1862 Matching 2792751	1890 Matching 0
1862 All Other 5602670	1890 All Other 0	1862 All Other 34803168	1890 All Other 0

V(D). Planned Program (Activity)

1. Brief description of the Activity

The Division of Agriculture faculty developed, evaluated, and disseminated needs-based programs that focus on the reduction of food insecurity within vulnerable populations. The Expanded Food and Nutrition Education Program was conducted in thirteen counties with a high percentage of Supplemental Nutrition Assistance program participants and Hispanic households. Program Assistants are used to conduct one-on-one and group training with individuals who fall within the parameters of the program. There is a series of twelve lessons utilized by staff that focuses on food budgeting, food safety, healthy lifestyles, healthy food consumption, meal planning, and nutritious food preparation.

The Division developed improved crop and animal systems to boost U.S. agricultural production and improve the global capacity to meet the growing food demand:

The University Of Arkansas Division Of Agriculture provided unbiased research-based information and technical assistance on topics related to crop production, animals and animal products. Information was disseminated focusing on the needs of consumers, the general public and livestock and row crop producers. The UA Division of Agriculture faculty worked together to understand related issues of livestock and row crop production, products and processing, and aquaculture. Aquaculture programs were conducted through collaborative efforts between UA educators and aquaculture faculty of the 1890 land grant institution, University of AR Pine Bluff. These activities expanded our knowledge of the impact on environmental and economic sustainability and the well-being of animals and humans alike. The goal of the research program was to provide pertinent basic and practical information row crop, animal and poultry production in order to remain competitive in the global market place.

2. Brief description of the target audience

The primary targeted audiences consist of the following:

Supplemental Nutrition Assistance Program participants

Hispanics

Single women

African Americans

Youth

Agricultural producers

Aquaculture producers

Agricultural businesses

Allied industry personnel

Consultants

Breeder managers

Hatchery managers

Commercial poultry producers

Commercial poultry companies

Other non-Division of Agriculture researchers

Research funding personnel & agencies

Policy and decision makers

Public

V(E). Planned Program (Outputs)**1. Standard output measures**

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	75048	143621	65874	1821

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

Year: 2009

Plan:

Actual: 1

Patents listed

Lactic acid bacteria and their use in swine direct-fed microbials

3. Publications (Standard General Output Measure)**Number of Peer Reviewed Publications**

2009	Extension	Research	Total
Plan			
Actual	15	91	106

V(F). State Defined Outputs**Output Target****Output #1****Output Measure**

- # of grants written and funded in support of Food and Nutrition education programming and research.

Year	Target	Actual
2009	{No Data Entered}	1

Output #2**Output Measure**

- # of news articles, public service announcements, radio and TV media programs in support of Foods and Nutrition education programs

Year	Target	Actual
2009	{No Data Entered}	24

Output #3**Output Measure**

- # of non-duplicated participants in Foods and Nutrition education 4-H programs

Year	Target	Actual
2009	{No Data Entered}	2307

Output #4**Output Measure**

- # of Food and Nutrition in-service trainings conducted

Year	Target	Actual
2009	{No Data Entered}	5

Output #5**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	71611

Output #6**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	3810

Output #7**Output Measure**

- Number of animal educational programs, workshops, educational meetings and/or field days.

Year	Target	Actual
2009	{No Data Entered}	172

Output #8**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	34608

Output #9**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	67604

Output #10**Output Measure**

- Number of animal producers conducting on farm demonstrations.

Year	Target	Actual
2009	{No Data Entered}	136

Output #11**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	2949

Output #12**Output Measure**

- Number of agronomic production education meetings (multi-topic) for food-related plant & plant products.

Year	Target	Actual
2009	{No Data Entered}	38

Output #13**Output Measure**

- Number of production education meetings that address fertilizer, soil and water management.

Year	Target	Actual
2009	{No Data Entered}	40

Output #14**Output Measure**

- Number of agronomic production education meetings that address variety selection for food-related plant & plant products.

Year	Target	Actual
2009	{No Data Entered}	40

Output #15**Output Measure**

- Number of production meetings that address soil & water testing for food-related plant & plant products production.

Year	Target	Actual
2009	{No Data Entered}	39

Output #16**Output Measure**

- Number of production meetings that address variety/hybrid selection for food-related plant & plant products production.

Year	Target	Actual
2009	{No Data Entered}	40

Output #17**Output Measure**

- Number of demonstrations/on-farm research for food-related plant & plant products production.

Year	Target	Actual
2009	{No Data Entered}	135

Output #18**Output Measure**

- Number of farm visits for food-related plant & plant products production.

Year	Target	Actual
2009	{No Data Entered}	263

Output #19**Output Measure**

- Number of field days for food-related plant & plant products production.

Year	Target	Actual
2009	{No Data Entered}	6

Output #20**Output Measure**

- Number of informal surveys of participants to measure cultural practices for food-related plant & plant products production.

Year	Target	Actual
2009	{No Data Entered}	128

Output #21**Output Measure**

- Number of hits to plant and plant products web-based educational material for food-related production information.

Year	Target	Actual
2009	{No Data Entered}	10500

Output #22

Output Measure

- Number of for food-related plant & plant products production clientele contacts from education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational methods.

Year	Target	Actual
2009	{No Data Entered}	128500

Output #23

Output Measure

- Number of food-related plant & plant products production education classes, workshops, group discussions, one-on-one interventions, demonstrations, and other educational events.

Year	Target	Actual
2009	{No Data Entered}	4085

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

O. No.	OUTCOME NAME
1	Number of participants who indicated that they increased their knowledge related to foods and nutrition following an educational class, seminar or workshop.
2	Number of individuals who increased physical activities as a result of completing an Extension program.
3	Number of participants who adopted positive nutrition practices.
4	Number of participants who indicated that they intend to adopt one or more healthy food/nutrition practices.
5	Number of business start ups related to animal and animal products
6	Number of livestock producers who increased knowledge or gained awareness related to livestock production management practices
7	Number of livestock producers who adopted a new practice
8	Number of livestock producers who initiated or improved their record keeping
9	Number of poultry producers who adopted new practices or technology
10	Number of allied poultry industry personnel who adopt new practices or technology.
11	Number of livestock producers who changed a management practice
12	Arkansas cash receipts from farm marketing (\$1,000) related to aquaculture enterprises.
13	Number of clientele who reported knowledge gained related to aquaculture.
14	Number of clientele who adopted new aquaculture practices.
15	Acres of harvested wheat (all)
16	# of clientele who select improved varieties
17	# of clientele using soil testing
18	# of clientele using plant testing

19	# of impacted acres using soil testing
20	# of impacted acres using plant testing
21	# of clientele (non-duplicated) who use the DD50 program for improved production efficiency
22	# of impacted acres using the DD50 program for improved production efficiency
23	# of clientele using RICESEED program
24	# of acres planted based on output from RICESEED program.
25	Yield (bushels) of harvested wheat (all)
26	Value of production of harvested wheat (all)
27	Acres of harvested soybeans (all)
28	Yield (bushels) of harvested soybeans
29	Value of production of harvested soybeans (all)
30	Acres of harvested rice (all)
31	Yield (pounds) of harvested rice (all)

Outcome #1

1. Outcome Measures

Number of participants who indicated that they increased their knowledge related to foods and nutrition following an educational class, seminar or workshop.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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2009 {No Data Entered} 848

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
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Number 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	Quantitative Target	Actual
2009	{No Data Entered}	1454

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
724	Healthy Lifestyle

Outcome #3**1. Outcome Measures**

Number of participants who adopted positive nutrition practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1523

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
724	Healthy Lifestyle

Outcome #4**1. Outcome Measures**

Number of participants who indicated that they intend to adopt one or more healthy food/nutrition practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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2009 {No Data Entered} 3106

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Food security is defined as households having access, at all times, to enough food for an active, healthy life for all household members. A report by the U.S. Department of Agriculture states that Arkansas is among the worst states in the nation for food insecurity (17.9 percent of all Arkansas households were food insecure). Groups that exhibit higher rates than the national average are households with incomes below the official poverty line, children in households headed by a single woman, Black and Hispanic households.

What has been done

EFNEP in Arkansas provides one-on-one and group interaction within 13 priority counties with a high food stamp and Hispanic population. The programs are informal and available at convenient locations and times. Program Assistants indigenous to the target population deliver intensive multi-session nutrition education lessons. The majority of adult participants complete the EFNEP curriculum in less than 12 months. Youth are taught in schools, after school environments, and through summer enrichment programs.

Results

Participants enrolled - 3106

1770 participants completed the program.

365 Hispanics reached.

1997 African-Americans reached.

1769 participants reported they compared prices before buying food as a result of completing the nutrition education program.

1299 participants reported that they seldom run out of food before the end of the month as a result of completing the nutrition education program.

4. Associated Knowledge Areas

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

Outcome #5**1. Outcome Measures**

Number of business start ups related to animal and animal products

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
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2009 {No Data Entered} 8

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Economic and environmental sustainability were two of the most critical issues to Arkansas

What has been done

Extension personnel at all levels identified the most appropriate methods of dealing with the issues. A combination of traditional local extension programming, electronic newsletters, multi county programming, cooperation with industry organizations, and all forms of mass media and personal consultations were used to provide the latest production information. Three projects, two funded by NRI grants and one by industry, are developing different strategies to improve sustainability. Strategies are: use of direct-fed microbials to young pigs as a way to reduce antibiotic use, optimization of non-toxic fescues to reduce fuel and other inputs to cattlemen, and use of no-till and low-till technology that saves over \$100/acre in fuel, labor and equipment costs for cattlemen.

Results

By product feeds from biofuels production have replaced much of traditional sources of feed for cattle. Practices long known to be important (ie. soil testing, forage testing, etc.) have been brought to the attention of producers who once again understood their importance. Management techniques like stockpiling forage rather than baling, using no till or minimum till to reduce fuel use, planning grazing systems to maximize production and reduce input costs, addressing the issue of increased internal parasite resistance, understanding target points for marketing cattle, and developing BMP's for poultry litter use have helped Arkansas producers adapt to the challenges presented in 2009.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
306	Environmental Stress in Animals

Outcome #6**1. Outcome Measures**

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	9447

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Economic and environmental sustainability were two of the most critical issues to Arkansas livestock and poultry producers. Management at the production level is the most direct method of producer impact on these issues. During 2008, soaring cost 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 determined 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 and personal consultations were used to provide the latest production information. Three projects 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.

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By product feeds from biofuels production replaced much of the traditional sources of feed for cattle. Practices long known to be important (ie. soil testing, forage testing, etc.) were brought to attention of producers who once again understood their importance. Management techniques like stockpiling forage rather than bailing, 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 2009

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases

Outcome #7**1. Outcome Measures**

Number of livestock producers who adopted a new practice

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1492

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Economic and environmental sustainability were two of the most critical issues to Arkansas livestock producers. There are practices that can help deal with these challenges. Oftentimes, small producers who make up a large percentage of Arkansas producers are not aware of new issues and the solutions that may be available.

What has been done

Extension personnel at all levels identified emerging issues of importance to their stakeholders. Using appropriate information delivery venues, a combination of traditional local extension programming, electronic newsletters, multi-county programming, cooperation with industry organization, and all forms of mass media and personal consultations were used to provide options.

Results

Because of heightened awareness that provided teachable moments, new practices ranging from more efficient grazing systems, stockpiling forage rather than expensive hay baling, well-designed fertilization programs, changed market in points for cattle to capture the increased value of forage brought on by high feedlot finishing costs, increased targeted use of by-products from biofuels production, better designed programs for efficient and environmentally sustainable use of poultry litter on pastures and other practices were adapted. Numbers listed are direct contact and we recognize that others probably adapted these practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases

Outcome #8

1. Outcome Measures

Number 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	Quantitative Target	Actual
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2009 {No Data Entered} 0

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
205	Plant Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
307	Animal Management Systems
311	Animal Diseases

Outcome #9**1. Outcome Measures**

Number 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	Quantitative Target	Actual
2009	{No Data Entered}	200

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The poultry industry in Arkansas is vertically integrated. Poultry integrators make decisions about the adoption of technology and convey that information to contract growers using their technical service personnel. However, growers do make decisions about environmental regulations, litter disposal, permitting, verification of practices, etc.

What has been done

Research was published and made available to management of vertically integrated companies. Information was also provided through meetings, electronically, and through other communication methods. Emphasis was placed on information regarding current issues and research concerns, environmental regulations, litter management and disposal, and changing poultry management practices.

Results

The industry continues to adopt technology that enhances production efficiency, product safety and sustainability. Growers are developing and implementing plans to comply with state and federal regulations for litter management, mortalities and other by-products of poultry productions.

4. Associated Knowledge Areas

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

Outcome #10**1. Outcome Measures**

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	20

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Poultry related jobs accounted for nearly \$3 billion in labor income in Arkansas or \$1 out of every \$4 in agricultural labor income. The over \$3.3 billion in cash receipts from the poultry industry amounted to 46.2% of all agricultural cash receipts. In addition, the poultry industry contributed over \$2.6 billion in value added to the Arkansas

economy. Yet owners of the 5640 poultry farms struggle to maintain competitive production efficiencies via new technology adoption.

What has been done

Applied research and field trials conducted by Extension Poultry faculty identified unsuitable energy technologies as well as problems with drinking water treatment, litter processing and feed delivery technologies. Information gained from applied research and field trials was shared with vertically integrated companies, allied industry representatives and production personnel via trade publications, workshop, one-on-one consultations, newsletters and CES publications.

Results

Informal observations indicated increase knowledge of drinking water treatment and litter processing technologies. In addition, technology adoption rates were estimated at 15%, resulting savings of approximately \$6.3 million.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases

Outcome #11

1. Outcome Measures

Number of livestock producers who changed a management practice

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1866

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Economic and environmental sustainability were two of the most critical issues facing Arkansas livestock producers. There are practices that can help deal with these challenges. Oftentimes, small producers who make up a large percentage of producers are not aware of new issues and available solutions.

What has been done

After stakeholders repeatedly said they needed to see how technology could be applied to real-world scenarios, a model farm was established at one of our Research and Extension Stations. The model farm demonstrates to cattlemen, especially small producers, not only how to actually incorporate and integrate critical research-based practices in a practical setting but also how to monitor results with accurate budgets.

Results

Because of heighten awareness that provided teachable moments, new research based practices ranging from more efficient grazing systems, stockpiling forage rather than expensive hay bailing, 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 used of by-products from biofuels production, better designed programs for efficient and environmentally sustainable use of poultry liter on pastures and other practices were adapted. Number listed is direct contact and we recognize others probably adapted these practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases

Outcome #12

1. Outcome Measures

Arkansas cash receipts from farm marketing (\$1,000) related to aquaculture enterprises.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	62775

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems

Outcome #13

1. Outcome Measures

Number 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	Quantitative Target	Actual
2009	{No Data Entered}	60

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
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases

Outcome #14**1. Outcome Measures**

Number of clientele who adopted new aquaculture practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	7

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Arkansas has over 100,000 farm ponds that provide important sources of recreation and supplemental food for rural families. Farm pond owners in regions where soils are acidic reported late winter to early spring fish kills and slow fish growth.

What has been done

As an on-going activity in support of our joint CES-CEP farm pond program, water samples for alkalinity testing were submitted by county faculty and analyzed by UAPB diagnostic laboratories, and alkalinity test kits were provided to county faculty. County faculty submitted pond bottom soil samples for analysis by the University of Arkansas Soil Testing and Research Laboratory to determine the lime requirement. Results with the appropriate liming rate and application methods were returned to pond owners.

Results

This joint CES-CEP activity helps rural Arkansans improve farm pond fisheries by identifying ponds that would benefit from lime and providing pond owners with information on appropriate liming rates, materials and application methods. Of the pond water samples submitted for analysis, approximately 50% had total alkalinity levels below 20 mg/L, indicating liming would be beneficial. Fish yields from properly managed, productive farm ponds are two to three times higher than from unmanaged ponds on acidic watersheds.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
311	Animal Diseases

Outcome #15**1. Outcome Measures**

Acres of harvested wheat (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	390000

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
112	Watershed Protection and Management
201	Plant Genome, Genetics, and Genetic Mechanisms
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #16**1. Outcome Measures**

of clientele who select improved varieties

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1761

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Arkansas is the largest rice-producing state in the USA representing almost half of the nation's total production. In order to maintain competitiveness and sustainability, rice production efficiency (relative to inputs, costs of production, and returns) must be improved continually.

What has been done

The most effective way to increase production efficiency is the release of new rice cultivars that enhance yield potential. The overall rice yield potential has increased by an average of 83 lbs/acre each year. The contribution of genetic gain to this yield increase is 47 bushels/acre. Considering more than 50% of the rice acreage in Arkansas is planted to cultivars developed by the University of Arkansas Breeding Program, this contribution has resulted in an additional 429 million dollars additional farm income over this 20-year period.

Results

Four new cultivars have been released in 2009 by the University of Arkansas that is anticipated will continue the major impact on the rice industry in the Southern USA. 'CL 142 AR' and 'CL 181 AR' appear to provide an additional 4% in yield potential compared to similar cultivars. It is also expected that 'CL 142 AR' may be produced on as much as 25% of the acreage in 2011.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
201	Plant Genome, Genetics, and Genetic Mechanisms
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #17**1. Outcome Measures**

of clientele using soil testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1211

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Direct-seeded, delayed flood rice (*Oryza sativa* L.) represents an important commodity for many Mid-south states in the US and is at times grown continuously, but more often grown in rotation with soybean [*Glycine max* (L.) Merr.] or other crops. Arkansas is the primary rice producing state in the US and harvests roughly 1.3 million acres per year. Current N fertilizer recommendations for rice in Arkansas are based on cultivar, previous crop, and soil texture which does not account for potentially mineralizable soil-N. Recommendations made using the current system do not take into account the amount of N that is being supplied by the soil and thus, can result in over or under application of N fertilizer. This in turn could cause economic losses due to reduced grain yields, increased disease susceptibility and lodging. Identification of a soil-based nitrogen test for rice production will allow more precise application of nitrogen fertilizers while utilizing native soil nitrogen and lowering potential environmental impacts due to excessive nitrogen application.

What has been done

A six year study involving laboratory and field trials have developed an alkali direct steam distillation technique for determining the nitrogen mineralization potential of a soil. Results collected from 25 site-years on silt loam soils shows a strong correlation ($r^2 = 0.89$) between the nitrogen fertilizer required to achieve 95% relative grain yield for rice and the nitrogen liberated with the new soil test when the soil was sampled to the 18 inch depth. The new soil nitrogen test is named 'Nitrogen-Soil Test for Rice' or 'N-ST*R'. N-ST*R was validated at eight silt loam sites in 2009 that varied in native soil nitrogen availability. N-ST*R predicted the correct nitrogen fertilizer rate to achieve 90, 95 and 100% relative grain yield at all eight sites. Validation studies will continue in 2010 on silt loam soils and if N-ST*R proves accurate again the new test will be evaluated in 2011 in the Rice Research Verification Program. The states of Louisiana, Mississippi, and Texas have started collaborating with us on the development of N-ST*R. The success of N-ST*R on silt loam soils in Arkansas has led to research with clay soils in the hope that we can have a nitrogen test for all of the soils were rice is grown in Arkansas and the southern Ricebelt.

Results

The new Nitrogen-Soil Test for Rice or N-ST*R will enable more accurate nitrogen fertilizer rate recommendations for rice because it will allow the producer to make nitrogen fertilizer decisions on an individual field basis rather than relying on a regional soil type basis. Implementation of N-ST*R will enable the optimal use of nitrogen fertilizer leading to the most optimum

4. Associated Knowledge Areas

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

- 205 Plant Management Systems
- 213 Weeds Affecting Plants

Outcome #18

1. Outcome Measures

of clientele using plant testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	401

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
112	Watershed Protection and Management
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #19

1. Outcome Measures

of impacted acres using soil testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	370187

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

The concentration broiler industry in northwest Arkansas generates large quantities of nutrient- and metal-enriched litter. Broiler litter is then typically land applied for disposal and a means to recycle the material as an organic fertilizer source. However, over time, increasing nutrient and metal concentrations in the soil over time can create the potential for negative environmental impacts if nutrient and metal mobility in the soil is enhanced from physical or chemical alteration of soil properties contributing to their storage in the soil profile.

What has been done

A study was initiated in Spring 2003 on small-scale, closely manageable plots at the Agricultural Research and Extension Center in Fayetteville, AR to evaluate the long-term effects of broiler litter application rate on soil profile properties, particularly soil nutrient and heavy metal contents. Broiler litter was applied annually at 0, 5.6, and 11.2 Mg ha⁻¹ over a 5-yr period. Soil was sampled annually to a 90-cm depth at 10-cm increments and characterized for acid-recoverable, Mehlich-3-extractable, and water-soluble P, K, Ca, Mg, S, Na, Fe, Mn, Zn, Cu, Al, As, and Cr, and pH, electrical conductivity, organic matter, and dissolved organic carbon. This objective was part of a wider study goal, which was to investigate the long-term broiler litter application rate effects on runoff, leaching, plant uptake and removal, and changes in soil storage of litter-derived nutrient and heavy metals.

Results

Based on the first five years of data collected in this long-term study, annual applications of broiler litter caused two-thirds of macro-nutrients and one-third of micro-nutrients/trace metals studied to increase over time in the soil profile, while nearly one-half of the macro-nutrients and one-fifth of the micro-nutrients/trace metals studied decreased over time in the unamended control. Study results showed that the majority of macro-nutrient changes were located in the upper soil depths, while the majority of the micro-nutrient/trace metal changes were located in lower soil depths. Results indicate that soil macro-nutrient changes may pose potential negative environmental impacts near the soil surface via runoff, whereas soil micro-nutrient/trace metal changes may pose potential negative environmental impacts in the sub-soil via leaching.

4. Associated Knowledge Areas

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

Outcome #20

1. Outcome Measures

of impacted acres using plant testing

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	11332

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #21

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	496

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
205	Plant Management Systems

Outcome #22

1. Outcome Measures

of impacted acres using the DD50 program for improved production efficiency

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	304880

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

205 Plant Management Systems

Outcome #23**1. Outcome Measures**

of clientele using RICESEED program

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	189

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 #24**1. Outcome Measures**

of acres planted based on output from RICESEED program.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	143500

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)****What has been done****Results****4. Associated Knowledge Areas**

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

Outcome #25**1. Outcome Measures**

Yield (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	Quantitative Target	Actual
2009	{No Data Entered}	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
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 #26

1. Outcome Measures

Value of production of harvested wheat (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	82539600

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #27**1. Outcome Measures**

Acres of harvested soybeans (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	3420000

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Glyphosate Resistant Pigweed development Soybean

What has been done

Development of Recommendations in both Roundup Ready and Liberty Link and Soybean for 2010

Results

An estimated 350,00 acres of soybeans are infested with glyphosate resistant Palmer amaranth (pigweed) in Arkansas. In 2009, this problem cost growers over 17 million dollars in the form of added weed control costs and lost yields. Research conducted in 2008 and 2009 have lead to the development of strategies for the control of this pest using existing technology and new technology (Ignite in LL soybean). In 2010, approximately 50% of soybean growers will adopt at least of these resistance management strategies as a result of this program. A fact sheet, several popular press articles, TV spots, grower meetings and field days were used to get this information out. Recommendations in the State Weed and Brush Control Guide (MP44) have been updated.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
111	Conservation and Efficient Use of Water
112	Watershed Protection and Management
201	Plant Genome, Genetics, and Genetic Mechanisms
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems

213

Weeds Affecting Plants

Outcome #28**1. Outcome Measures**

Yield (bushels) of harvested soybeans

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	37

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)****What has been done****Results****4. Associated Knowledge Areas**

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #29**1. Outcome Measures**

Value of production of harvested soybeans (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1211962500

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

What has been done

Results

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #30

1. Outcome Measures

Acres of harvested rice (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	1475000

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
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 #31**1. Outcome Measures**

Yield (pounds) of harvested rice (all)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	150

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)****What has been done****Results**

Arkansas is the largest rice-producing state in the USA representing almost half of the nation's total production. In order to maintain competitiveness and sustainability, rice production efficiency (relative to inputs, costs of production, and returns) must be improved continually. The most effective way to increase production efficiency is the release of new rice cultivars that enhance yield potential. The overall rice yield potential has increased by an average of 83 lbs/acre each year. The contribution of genetic gain to this yield increase is 47 bushels/acre. Considering more than 50% of the rice acreage in Arkansas is planted to cultivars developed by the University of Arkansas Breeding Program, this contribution has resulted in an additional 429 million dollars additional farm income over this 20-year period. Four new cultivars have been release in 2009 by the University of Arkansas that is anticipated will continue the major impact on the rice industry in the Southern USA. 'CL 142 AR' and 'CL 181 AR' appear to provide an additional 4% in yield potential compared to similar cultivars. It is also expected that 'CL 142 AR' may be produced on as much as 25% of the acreage in 2011.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

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, changes in payments to farmers, increased production input costs, land grant university funding, the downturn in the economy, and as always weather conditions. Any or all of these factors could cause projected outcomes to vary widely.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- Before-After (before and after program)
- During (during program)
- Time series (multiple points before and after program)

Evaluation Results

The Division of Agriculture faculty developed, evaluated, and disseminated needs-based programs that focused on boosting agricultural production to meet growing food demand and to reduce food insecurity within vulnerable populations.

The Expanded Foods and Nutrition Programs were conducted within thirteen counties with a high percentage of Supplemental Nutrition Assistance program participants. Program Assistants are used to conduct one-on-one and group training with individuals falling within the parameters of the program. There is a series of twelve lessons used by staff that focused on food budgeting, healthy lifestyles, healthy food consumption, meal planning, and nutritious food preparation. The target population for the program: Single women, African-Americans and Hispanic individuals and families, and children of families receiving supplemental nutrition assistance.

1769 EFNEP participants reported they were comparing prices before they purchased food as a result of completing the nutrition education program.

1109 (63%) of EFNEP graduates thought about healthy food choices when deciding what to feed their families.

1249 (71%) of EFNEP graduates more often planned meals in advance.

1106 (71%) of EFNEP graduates used a list for grocery shopping.

1159 youth from 69 groups reported eating a variety of foods.

A state-wide survey was conducted asking livestock producers their most preferred methods for receiving information from Extension, direct methods were not ranked very high. Indirect methods, however, were ranked high. These results provided the impetus for developing electronic newsletters. The actual number of indirect contacts adults was above target due to concerted effort to establish electronic newsletters in the area of beef cattle production, dairy cattle production, small ruminates production, forage and grazing management production.

The number of on farm demonstrations was much higher than expected. This was due to a special program called "300 Day Grazing" which demonstrated research based practices to reduce the dependences of harvest forages. In 2009 over 70 300 Day Grazing demonstration were implemented alone.

The number of producers who actually initiated or improved record keeping was higher than expected. The increase was due to more producers keeping both financial and production records. Both types of records are important and play key roles in managing a livestock operation.

Yields in corn, soybean, and rice verification fields that used UA Division of Agriculture recommendations were compared to state averages. The overall rice yield potential has increased by an average of 83 lbs/acre each year. The contribution of genetic gain to this yield increase is 47 bushels/acre. Considering more than 50% of the rice acreage in Arkansas is planted to cultivars developed by the University of Arkansas Breeding Program, this contribution has resulted in an additional 429 million dollars additional farm income over this 20-year period. Four new cultivars were released in 2009 by the University of Arkansas that is anticipated will continue the major impact on the rice industry in the Southern USA. 'CL 142 AR' and 'CL 181 AR' appear to provide an additional 4% in yield potential compared to similar cultivars. It is also expected that 'CL 142 AR' may be produced on as much as 25% of the acreage in 2011. Data on shifts in production technology, acreage, cropping systems, and enrollment were compared to historic levels and trends. The data shows that the yield levels of these crops increased.

Key Items of Evaluation

Betty G. enrolled in the Expanded Food and Nutrition Education Program in March 2009. After successfully graduating from the program she was able to secure a position in a community restaurant. Betty G. indicated that her knowledge of portion sizes, food safety and meal planning helped her get the position of head cook. She accredits this success to what was learned through EFNEP (Lee County).

"An EFNEP participant and her family had been having money problems with the state of the economy and not enough work for the husband. Their 3-month-old infant had to be hospitalized. Through EFNEP the participant learned to read labels and choose good quality foods by using generic brands and reading sale ads. She began to plan meals for the week and make menus. Now they do not run out of food and are able to save up to \$50 each month on food. As a result of saving money on food they have been able to pay on some of their debts such as the hospital bill," Sandra Guzman, EFNEP Program Assistant, Benton County.

An EFNEP participant said that "Learning that I need healthy snacks between meals has been a blessing. It has definitely decreased the number of blackouts I was having," (Benton County).

The overall rice yield potential has increased by an average of 83 lbs/acre each year. The contribution of genetic gain to this yield increase is 47 bushels/acre. Considering more than 50% of the rice acreage in Arkansas is planted to cultivars developed by the University of Arkansas Breeding Program, this contribution has resulted in an additional 429 million dollars additional farm income over this 20-year period.

Four new cultivars have been release in 2009 by the University of Arkansas that is anticipated will continue the major impact on the rice industry in the Southern USA. 'CL 142 AR' and 'CL 181 AR' appear to provide an additional 4% in yield potential compared to similar cultivars. It is also expected that 'CL 142 AR' may be produced on as much as 25% of the acreage in 2011.

Applied research and field trials conducted by Division of Agriculture Poultry faculty identified unsuitable energy technologies as well as problems with drinking water treatment, litter processing and feed delivery technologies. Information gained from applied research and field trials was shared with allied industry representatives through a variety of delivery methods. Observations indicated increased knowledge of drinking water treatment and litter processing technologies. In addition, technology adoption rates were estimated at 15%, resulting savings of approximately \$6.3 million.

V(A). Planned Program (Summary)**Program # 12****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
702	Requirements and Function of Nutrients and Other Food Components	10%		10%	
703	Nutrition Education and Behavior	25%		10%	
704	Nutrition and Hunger in the Population	15%		25%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	5%		45%	
724	Healthy Lifestyle	25%		10%	
806	Youth Development	20%		0%	
Total		100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	14.4	0.0	2.3	0.0

Actual	14.4	0.0	2.3	0.0
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2. Actual dollars expended in this Program (includes Carryover Funds from previous years)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
249816	0	16220	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
202971	0	16645	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1441367	0	766357	0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

Multisession as well as social marketing programs were conducted with a varied adult base. Curricula that incorporated research and emphasizing lifestyles was used to reach audiences with needs-based information. The University of Arkansas Division of Agriculture faculty designed and distributed educational resources that could be used with youth, adults, parents,

gradparents and collabortaors.

Programs included:

Walk Across Arkansas

SNAP-ED

General Nutrition Education programs and activities

Dining with Diabetes

Child Care Provider Training

2. Brief description of the target audience

Audiences included but not limited to:

Youth

Teachers and school personnel

Parents

Adults

Grandparents

Child care providers

General public

Federal and state agency employees

Minorities

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	33190	290572	324655	6022

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

Patent Applications Submitted

Year: 2009

Plan:

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan			
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	14

Output #2**Output Measure**

- Number of news articles, public service announcements, radio and TV media programs in support of Food, Nutrition, and Health programs.

Year	Target	Actual
2009	{No Data Entered}	33

Output #3**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	2216

Output #4**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	51552

Output #5**Output Measure**

- Number of Food, Nutrition, and Health in-service trainings conducted.

Year	Target	Actual
2009	{No Data Entered}	3

Output #6**Output Measure**

- Number of Federal grants and contracts.

Year	Target	Actual
2009	{No Data Entered}	1

Output #7**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	358942

Output #8

Output Measure

- Number of extension educators involved in discussions regarding public and organizational nutrition and health policies, regulations and industry practices.

Year	Target	Actual
2009	{No Data Entered}	23

Output #9

Output Measure

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

Year	Target	Actual
2009	{No Data Entered}	19497

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

O. No.	OUTCOME NAME
1	Number of participants who indicated that they increased their knowledge related to food, nutrition, and health following an educational class, seminar or workshop
2	Number of individuals who increased physical activities as a result of completing an Extension program.
3	Number of participants who adopted positive nutrition practices.
4	Number of participants reporting reduction in body weight after completing a nutrition education program.
5	Number of participants who indicate that they intend adopt one or more healthy food/ nutrition practices.
6	Number of students involved in research focusing on overweight and obesity.

Outcome #1

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	17743

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

Number 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	Quantitative Target	Actual
2009	{No Data Entered}	7798

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**

Number of participants who adopted positive nutrition practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	12856

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

One in three Arkansas public school students are overweight or at risk for being overweight. According to the Youth Risk Behavior Survey, 87% of Arkansas students reported eating fewer than five servings of fruits and vegetables each day and 58% did not participate in the recommended amount of physical activity. BMI results for 2008-2009 showed that 20.4% of students tested were obese, and 17.2% were overweight. Arkansas has addressed these issues by establishing the Arkansas Child Health Advisory Committee to make nutrition and physical activity recommendations to the State Board of Education and the State Board of Health.

What has been done

The University of Arkansas Cooperative Extension Service SNAP-Ed program is collaborating with schools across the state, to provide nutrition education to children in schools where at least 50% of students qualify for free and reduced-price lunch. In 2009, more than 37,000 youth participated in the school-based SNAP- Ed program.

Results

Eighty percent of children involved in SNAP said they intended to adopt one or more healthy nutrition practice, 48% said they are eating more fruits, 37% said they are eating more vegetables, 38% said they are drinking/ eating more low fat or fat-free dairy foods and 68% said they are more physically active.

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

Number 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	Quantitative Target	Actual
2009	{No Data Entered}	175

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 #5

1. Outcome Measures

Number of participants who indicate that they intend adopt one or more healthy food/ nutrition practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	13771

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
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
724	Healthy Lifestyle

Outcome #6

1. Outcome Measures

Number 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	Quantitative Target	Actual
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2009 {No Data Entered} 236

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Overweight and obesity have reached epidemic proportions in the United States. Recent reports indicate that Arkansas ranks seventh in incidence of obesity with more than 63 % of adults and 37% of school children being overweight or obese. Since obesity is a major health problem that frequently begins in childhood and adolescence, it is important to determine/provide interventions to prevent inappropriate eating behavior.

What has been done

Two hundred, thirty-six (236) college age students participated in the pilot study. Of those, 206 were female and 25 were male with 80 being 10-19 years of age, 128 being 20-22 years of age and 23 subjects being over the age of 23 years. Body measurements were taken using the [TC]2 NX12 Body Measurement System. Body composition and BMI were measured using bioelectrical impedance analysis. A BIQ with additional questions was administered to evaluate body image perceptions.

Results

One-way Analysis of Variance (ANOVA) with Tukey's method for post hoc comparison were performed to examine the relationship between body image, body shape and body mass index (BMI). Significant differences were also found between body shape ($p < .001$) and BMI indicating that as BMI increased, body shape increased.

A second ANOVA indicated that significant differences existed between body shape and hair texture/thickness, muscle tone and definition, body proportions, weight and mean BIQ ($p < .05$).

Participants in this study appeared to understand the relationship between BMI and the muscle tone and definition, body proportions, weight, and physical coordination.

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

V(H). Planned Program (External Factors)**External factors which affected outcomes**

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

Brief Explanation

External funding and a change in priority programming impacted the reporting efforts for several of the programs originally designated as priorities within the Food, Nutrition, and Health initiative. The economic downturn during the year impacted how programming resources were aligned; thus impacting the delivery of some programs. Additionally, a reduction in staff (FTEs) also had a negative impact on program delivery and reporting. Realignment data significantly impacted the outcomes. . .negatively and positively.

The downturn in the economy increased the number of Arkansas receiving Supplemental Nutrition Assistance Program (SNAP) benefits by 10% from the same time last year.

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

1. Evaluation Studies Planned

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

Evaluation Results

- 723 youth reported decreasing the amount of time spent in sedentary activities such as watching TV or playing video games
- 305 participants reported altering their behavior to follow standard serving sizes for one or more of the MyPyramid food groups as a result of completing the nutrition education program
- 57% of youth participating in SNAP-Ed activities said they are more active
- 38% of youth participants in SNAP-ED said they are more physically active
- SNAP-Ed reached over 41,500 SNAP participants
- 59% of adults participating in multisession classes indicated they made one or more positive dietary change as a result of participating in the SNAP-Ed program.

At Fouke Elementary school in Miller county, students learned about basic nutrition with an emphasis on increased consumption of fruits and vegetables, whole grains and low-fat dairy foods. Incorporating hands on food preparation and sampling of new foods is a critical component of the program. Bulletin boards focusing on healthy eating were displayed in the foyer of the school to reinforce nutrition lessons. In addition, nutrition newsletters were sent home to parents. In the 2007-2008 school year 19.2% of all children measured at Fouke Elementary in Miller County were at risk for the overweight category, and 20.3% of all children measured were identified as overweight. The BMI report for the school year 2008-2009 showed a reduction in BMI scores. Of the children measured, 18.8% were at risk for the overweight category, and 18.4 % were identified as overweight. According to the principal, it was the students' participation in the SNAP-Ed program that brought about these lower BMI numbers. "Our BMI numbers are lower this year and we owe it all to the SNAP-Ed program." For the past six years, nutrition education has been taught in the Fouke Elementary school to an average of 550 students grades Kindergarten to 5th grade, through the efforts of the SNAP-Ed program, the principal, and school faculty.

Childhood obesity is recognized as a predictor of adolescent and adult obesity. Children develop habits when they are 5 to 10 years old that remain with them the rest of their lives, including that of a sedentary lifestyle. Getting adequate physical activity may be the most important factor in maintaining body weight and weight balance. Obesity in childhood is an independent risk factor for adult obesity and its associated health problems. Walk Across Arkansas (WAA) is a strategy to increase physical activity among youth and adults. WAA provides measurable results of impact (based on miles walked measured with pedometers). The 3,156 individuals who participated in WAA in the past year have potentially saved the state \$797,540 (based on 198,770 total miles walked collectively in 2009) in healthcare cost. In addition, members reported increasing energy, weight loss, lowered blood pressure and cholesterol, and even better control of glucose.

Key Items of Evaluation

- 1) Comments from Teachers' at Fouke Elementary School in Miller County:
 - "This program has made me more aware of what I eat and drink. Now I model good behavior for my students."
 - "Students are bringing healthier choices in their lunch boxes. I do not see as many soft drinks and they are buying milk instead."
 - "Students are bringing healthier snacks."
 - "I've noticed that in the lunch room, fewer carrot sticks are going in the trash."
 - "My students love this program and I do too. They really learn a lot from it."
- 2) "There are changes in my student's food choices. The students have been eating better at lunch and have told me about their healthier snack choices," Prairie County teacher.
- 3) Students at JF Wahl Elementary school in Phillips County have had several years of SNAP-Ed nutrition

education. Students have participated in Body Walk, MyPyramid Journey, Germ City, Professor Popcorn Day, and multi-session nutrition lessons. A survey of parents whose children participated in school-based nutrition education projects revealed that the SNAP-Ed program in Phillips County is reaching parents through their children, and parents are making changes at home. Parents surveyed in Phillips County reported that as a result of SNAP-Ed 74% of children asked for more or different fruits, vegetables, milk or yogurt, 76% talked to their parents about healthy food and/or snacks, 74% of children talked to their parents about being more active and 77% of parents had made changes in their family's eating and/or had been more physically active. Of the parents who reported changes, 97% eat or try different fruits, 94% are more active, 93% eat or try different vegetables, 93% drink more water, 82% eat more high-fiber/whole grain foods, 81% consume less sugary foods and drinks, 77% eat less high-fat or fried foods and 64% eat more low fat or fat-free dairy foods.

4) The Body Walk nutrition and health exhibit visits elementary school students across Arkansas. Since 2003, the Body Walk has reached over 122,000 children. Ninety-eight percent of county extension agents reported that the Body Walk is a great service to Arkansas communities. Teachers say children are bringing more fruit from home as opposed to junk food and choosing to be more physically active. "They are eating more salads. They also eat their fruits like apples, pears and grapes. They talk about getting nutrients from the foods that help their bodies stay active and strong," Teacher Kim T., Izard County.

Collaborative efforts, such as the SNAP-Ed program, have contributed to the improvement of the health of children and families in Arkansas. The success of the program continues to bring collaboration between the University of Arkansas Cooperative Extension Service and schools.

V(A). Planned Program (Summary)**Program # 13****1. Name of the Planned Program**

Food Safety

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
403	Waste Disposal, Recycling, and Reuse	0%		5%	
501	New and Improved Food Processing Technologies	0%		25%	
502	New and Improved Food Products	2%		10%	
503	Quality Maintenance in Storing and Marketing Food Products	15%		5%	
504	Home and Commercial Food Service	33%		5%	
702	Requirements and Function of Nutrients and Other Food Components	10%		10%	
703	Nutrition Education and Behavior	15%		5%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	10%		25%	
724	Healthy Lifestyle	15%		10%	
Total		100%		100%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	8.6	0.0	20.3	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
150027	0	430078	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
121894	0	441342	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
865615	0	9275742	0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

The Division of Agriculture faculty and staff will develop, evaluate, and disseminate education and curricula, incorporating new research and emphasizing healthy lifestyles.

Programs include:

ServSafe certification programs

Food preservation classes and workshops

Food safety and sanitation programs and activities

Commercial food safety and processing

Better Process Control School

Quarterly HAACP roundtable meetings

Food, Nutrition, and Health workshops, demonstrations, group discussions

2. Brief description of the target audience

Audiences include, but are not limited to:

Food companies

Entrepreneurs and restaurants

Food service employees and/or food handlers

Employers and employees

School personnel

Child care providers

Youth, adults and seniors

V(E). Planned Program (Outputs)**1. Standard output measures**

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	2510	661	16230	0

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

Year: 2009

Plan:

Actual: 0

Patents listed**3. Publications (Standard General Output Measure)****Number of Peer Reviewed Publications**

2009	Extension	Research	Total
Plan			
Actual	0	40	40

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	Target	Actual
2009	{No Data Entered}	348

Output #2**Output Measure**

- Number of participants in quarterly HACCP roundtables.

Year	Target	Actual
2009	{No Data Entered}	128

Output #3**Output Measure**

- Number of ServSafe classes offered.

Year	Target	Actual
2009	{No Data Entered}	20

Output #4**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	2536

Output #5**Output Measure**

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

Year	Target	Actual
2009	{No Data Entered}	394

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

O. No.	OUTCOME NAME
1	Number of participants who indicated that they increased their knowledge related to food, nutrition and health following an educational class, seminar or workshop.
2	Number of participants receiving certification in Better Process Control, Culinary Scientist, and ServSafe.
3	Number of participants who adopted positive nutrition practices.
4	Number of participants who indicate that they intend to adopt one or more healthy food nutrition practices.

Outcome #1**1. Outcome Measures**

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	143

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Exposure to a variety of infectious diseases in a school population is inevitable. According to the Centers for Disease Control and Prevention, keeping hands clean is one of the most important ways to prevent the spread of infection and illness. Many children don't know that many viruses, colds, and cases of the flu could be prevented by effective handwashing and that everyday objects (doorknobs, books, cell phones) are covered with bacteria that may remain for up to 24 hours. Germ City and Fight BAC provide an avenue for learning about the impact and transmission of bacteria.

What has been done

In preparation for the cold and flu season, the UA Cooperative Extension service in 32 counties partnered with 75 schools to teach children proper hand washing techniques. County Extension faculty utilized the Fight BAC curriculum and Germ City interactive walk-through exhibit to teach children what germs are and when, why, and how to wash their hands. In FY09, more than 15,000 contacts with youth in grades pre-K through 9th grade provided 1,236 learning experiences on the importance of proper hand washing. To reinforce what the students learned at school, educational materials on food safety and hand washing were sent home to parents in 31 schools reaching nearly 4,000 parents.

Results

Statewide, 85% of youth asked about their personal hand washing habits reported or demonstrated improvement in their hand washing practices. The middle school counselor in one middle school reported that even after summer break, fewer students visited the nurses office than prior to the hand washing lesson. She overheard the students talking about germs and how to avoid getting germs into their bodies. She heard one student tell another not to put his lunch ticket in his mouth because it might be covered with germs. In another county, more than 90% of 72 3rd-and 4th-graders reported they intended to wash their hands for at least 20 seconds after coughing and sneezing, playing outside, using the bathroom, and playing with animals and before eating and preparing food. After the Fight Bac and Germ City lessons in another county, 96% of 151 kindergarteners demonstrated proper hand washing.

Preventing transmission of illnesses helps keep students healthy and in school and parents at work.

4. Associated Knowledge Areas

KA Code	Knowledge Area
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502	New and Improved Food Products
503	Quality Maintenance in Storing and Marketing Food Products
504	Home and Commercial Food Service
703	Nutrition Education and Behavior
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Number of participants receiving certification in Better Process Control, Culinary Scientist, and ServSafe.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	241

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The food industry of Arkansas needs continuous training to remain globally competitive. Workshops and training sessions offered and conducted will allow them to remain prosperous and competitive.

What has been done

Arkansas food safety programs focus on the production, processing, distribution, and preparation of food. Better Process Control School (BPCS), Culinary (training technologists in culinary skills), and ServSafe(r) help the food industries implement food safety systems and comply with state and federal regulations. BPCS has certified more than 2,340 people from major canning companies since it started in 1973, and Extension has been offering ServSafe(r) to retail food establishments for more than 10 years.

Results

In 2009, 348 participants were enrolled in the BPCS, Culinary Scientists, and ServSafe(r) programs. Twenty ServSafe(r) programs were offered across the 75 counties in Arkansas. Of the 306 participants enrolled in ServSafe(r), 201 were certified, producing a certification rate of 65% for the year. Forty-two participants were enrolled in BPCS with 40 receiving certification. For the University of Arkansas, BPCS has served as a springboard to other food-related workshops for industry to include food safety, food defense, food labeling, microbiology, sensory evaluation, and other courses under development.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies

- 502 New and Improved Food Products
- 503 Quality Maintenance in Storing and Marketing Food Products
- 504 Home and Commercial Food Service
- 703 Nutrition Education and Behavior
- 712 Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Measures

Number of participants who adopted positive nutrition practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	14076

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 #4

1. Outcome Measures

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

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	46

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
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
724	Healthy Lifestyle

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- 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 programs within the new Food Safety initiative; 2) Several state defined outcomes were moved from the Food, Nutrition, and Health State Planned Programs to the Food Safety initiative; 3) The Food Preservation program was a relatively new focus after being dominant for many years. New programs materials were developed and trainings offered; 4) A reduction in staff (FTEs), which reduced the amount programming in several counties, had a negative impact on program delivery for the Food Safety and Food Preservation component; 5) The economic downturn impeded the replacement of staff and the attainment of resources for program implementation.

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

1. Evaluation Studies Planned

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

- During (during program)
- Case Study

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.

348 participants enrolled in BPCS, Culinary Scientist, and ServSafe programs.

20 ServSafe classes conducted, 141 received certification producing a certification rate of 65%.

40 participants recieved certification through BPCS.

Key Items of Evaluation

UA Cooperative Extension service in 32 counties partnered with 75 schools to teach children proper hand washing techniques. County Extension faculty utilized the Fight BAC curriculum and Germ City interactive walk-through exhibit to teach children what germs are and when, why, and how to wash their hands. In FY09, more than 15,000 contacts with youth in grades pre-K through 9th grade provided 1,236 learning experiences on the importance of proper hand washing. More than 90% of 72 3rd-and 4th-graders reported they intended to wash their hands for at least 20 seconds after coughing and sneezing, playing outside, using the bathroom, and playing with animals and before eating and preparing food. After the Fight Bac and Germ City lessons in another county, 96% of 151 kindergarteners demonstrated proper handwashing.

V(A). Planned Program (Summary)**Program # 14****1. Name of the Planned Program**

Sustainable Energy

V(B). Program Knowledge Area(s)**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	10%		0%	
102	Soil, Plant, Water, Nutrient Relationships	10%		0%	
123	Management and Sustainability of Forest Resources	25%		0%	
131	Alternative Uses of Land	10%		0%	
202	Plant Genetic Resources	10%		0%	
204	Plant Product Quality and Utility (Preharvest)	10%		0%	
402	Engineering Systems and Equipment	10%		0%	
601	Economics of Agricultural Production and Farm Management	5%		0%	
605	Natural Resource and Environmental Economics	10%		0%	
	Total	100%		0%	

V(C). Planned Program (Inputs)**1. Actual amount of professional FTE/SYs expended this Program**

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	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
43356	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
35226	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
250155	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Develop educational materials, curriculum, & resources
 Workshops
 Field days
 Demonstrations
 News articles
 Newsletter
 Web-based education
 Continuing education
 Lab and field research

2. Brief description of the target audience

Youth
 Agri business
 Row crop agricultural producers
 Consultants
 Forest landowner groups
 Forest industry
 Loggers
 Natural resource professionals
 Landowners
 Educators
 Agency personnel
 Livestock producers
 General public
 Researchers
 Policy makers
 Research funding personnel and agencies

V(E). Planned Program (Outputs)

1. Standard output measures

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	500	1000	100	0

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

Patent Applications Submitted

Year: 2009
 Plan:
 Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2009	Extension	Research	Total
Plan			

Actual	2	3	5
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V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of programs held related to sustainable energy.

Year	Target	Actual
2009	{No Data Entered}	3

Output #2

Output Measure

- Number of sustainable energy field demonstrations.

Year	Target	Actual
2009	{No Data Entered}	5

Output #3

Output Measure

- Number of field days related to sustainable energy.

Year	Target	Actual
2009	{No Data Entered}	4

Output #4

Output Measure

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

Year	Target	Actual
2009	{No Data Entered}	4

Output #5

Output Measure

- Number of sustainable energy events for row crop producers.

Year	Target	Actual
2009	{No Data Entered}	1

Output #6

Output Measure

- Number of sustainable energy events for livestock producers.

Year	Target	Actual
2009	{No Data Entered}	1

Output #7

Output Measure

- Percentage of farmers using biofuel in their farm equipment.

Year	Target	Actual
2009	{No Data Entered}	90

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

O. No.	OUTCOME NAME
1	Number of landowners indicating an increased understanding of sustainable energy.
2	Number of locations for bioenergy crop demonstrations and research fields.
3	Economic value of bio-based fuels produced.
4	Diversification of bioenergy crops

Outcome #1**1. Outcome Measures**

Number of landowners indicating an increased understanding of sustainable energy.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	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
102	Soil, Plant, Water, Nutrient Relationships
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
204	Plant Product Quality and Utility (Preharvest)
402	Engineering Systems and Equipment
605	Natural Resource and Environmental Economics

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	Quantitative Target	Actual
2009	{No Data Entered}	6

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Biofeed stock and bioenergy crops are relatively new topics for the UA Division of Agriculture. What specific species of trees, grass, and other woody plants might be appropriate for biofeedstock in Arkansas is unknown. Demonstrations and research that incorporate local conditions including soils, moisture regimes, and farming practices are therefore needed to increase our understanding of producing bioenergy feedstock.

What has been done

Field tests of bioenergy crops are being conducted at a number of Division of Agriculture locations, including the Southeast Research and Extension Center at Monticello, Southwest Research and Extension Center at Hope, Lon Mann Cotton Research Center at Marianna, Pine Tree Research Center at Colt, Northeast Research and Extension Center at Keiser, Rohwer Research Station, Arkansas Agricultural Research and Extension Center at Fayetteville and in fields of cooperating farmers.

Results

Field-based research into woody plants require a greater lengths of time than most most annual crops. Field demonstrations were successfully established in 2008-2009. Results will be forthcoming.

4. Associated Knowledge Areas

KA Code	Knowledge Area
101	Appraisal of Soil Resources
102	Soil, Plant, Water, Nutrient Relationships
131	Alternative Uses of Land
202	Plant Genetic Resources
204	Plant Product Quality and Utility (Preharvest)
601	Economics of Agricultural Production and Farm Management

Outcome #3**1. Outcome Measures**

Economic value of bio-based fuels produced.

Not Reporting on this Outcome Measure

Outcome #4**1. Outcome Measures**

Diversification of bioenergy crops

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)****Grasses as Dedicated Bioenergy Crops**

Grasses that have high biomass yield can serve as feedstocks for producing biofuels. Arkansas has great potential for producing biomass from its grasslands, cropland, and forests; however information is lacking on performance of varieties, response to nitrogen fertilizer, minimum plants densities needed to assure high yields, effective herbicides for controlling weeds during establishment, and the timing of maximum yield in relation to changes in quality of the biomass.

What has been done

We have discovered large differences in biomass yield potential of switchgrass between a site in northwest Arkansas on a former pasture and a site in east-central Arkansas on former row-crop land. The latter produced much lower yield, probably because of a restricted rooting zone and low subsoil fertility. We created a growth curve of switchgrass that identified August as the month of maximum biomass accumulation, with only about 10% yield loss from August to January. No significant differences in biomass yield were detected by applying increasing rates of poultry litter or urea fertilizer to switchgrass. Several herbicides were identified that permitted superior establishment of switchgrass in a no-till method of planting into a permanent meadow.

Results

The large difference in biomass yield between the two test sites indicates that subsoil disruption to break natural soil pan and a plow pan would likely benefit switchgrass yields. Growth curve data indicated that switchgrass stands can remain standing in the field even after end-of-year senescence with minimal yield loss through mid-January. Harvest will have to be delayed until December before the standing biomass moisture content declines below 20%, a level considered safe for direct chopping and storage. Growth data were used to modify ALMANAC, a crop simulation model, to improve its accuracy in predicting biomass yield in other locations in Arkansas. Such a model will be useful for a future bioenergy industry to plan the location and timing of harvests to meet biofuel production needs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
131	Alternative Uses of Land

204	Plant Product Quality and Utility (Preharvest)
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Other (Emerging Technologies)

Brief Explanation

Sustainable energy crops are easily impacted by external forces beyond our control. These diverse external factors can include changes in the economy, markets for other energy sources, shifts in public policy, and technology.

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

1. Evaluation Studies Planned

- After Only (post program)
- Before-After (before and after program)
- Case Study
- Comparison between locales where the program operates and sites without program intervention
- Other (Economic Models)

Evaluation Results

Programs in sustainable energy are relatively new, therefore the evaluation process is in its early stages. For example, field demonstrations indicate that the technological processes for developing sustainable energy through biomass sources exists, however, the economic viability is unknown.

Key Items of Evaluation

The UA Division of Agriculture Experiment Station received a 1.9 million dollar multi-state DOE grant in 2009 to develop bioenergy programs. This includes oil seed crops for biodiesel and biomass crops for ethanol and syngas production.

V(A). Planned Program (Summary)

Program # 15

1. Name of the Planned Program

Climate Change

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
101	Appraisal of Soil Resources	0%		10%	
102	Soil, Plant, Water, Nutrient Relationships	0%		10%	
111	Conservation and Efficient Use of Water	0%		15%	
112	Watershed Protection and Management	0%		10%	
131	Alternative Uses of Land	0%		5%	
132	Weather and Climate	0%		10%	
136	Conservation of Biological Diversity	0%		10%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		5%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		5%	
205	Plant Management Systems	0%		10%	
405	Drainage and Irrigation Systems and Facilities	0%		5%	
605	Natural Resource and Environmental Economics	0%		5%	
Total		0%		100%	

V(C). Planned Program (Inputs)

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

Year: 2009	Extension		Research	
	1862	1890	1862	1890
Actual	0.0	0.0	1.3	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	29657	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	30434	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	487041	0

V(D). Planned Program (Activity)**1. Brief description of the Activity**

The University of Arkansas Division of Agriculture developed the Center for Agricultural and Rural Sustainability (CARS) in 2007 in order to better coordinate, integrate, and motivate innovation in research, outreach, and education into land-based prosperity. As part of this work, CARS has initiated a series of projects aimed at measuring and reducing greenhouse gas (GHG) emissions from agricultural production, processing, and distribution practices. CARS has pioneered use of life cycle analyses (LCAs) in US agriculture using high spatial resolution data. The three major projects are: 1. Dairy LCA for liquid milk, from cradle to grave; 2. Cotton LCA for GHG emissions from seed to farm gate; Pork LCA from cradle to grave. These projects will provide the most comprehensive and geographically explicit LCAs for US agriculture ever conducted, and will support innovations in reductions of GHG emissions across agricultural production practices. In addition, CARS is spearheading a global initiative on the impact of climate change on crop production at high spatial resolution based on water availability.

2. Brief description of the target audience

Policy makers (USDA, USEPA, USDOE), supply chain managers (consumer package goods, WalMart, Krogers, and Safeway).

V(E). Planned Program (Outputs)**1. Standard output measures**

2009	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
Actual	800	4000	0	0

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

Year: 2009

Plan:

Actual: 0

Patents listed**3. Publications (Standard General Output Measure)****Number of Peer Reviewed Publications**

2009	Extension	Research	Total
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Plan			
Actual	0	4	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- External funding for research.

Year	Target	Actual
2009	{No Data Entered}	400000

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

O. No.	OUTCOME NAME
1	Development of metrics for greenhouse gas emissions in agriculture.
2	Life Cycle Inventory methodology and data for row crops for greenhouse gas.
3	Reduction of impact of row crop agriculture in the US on biodiversity.
4	Integrated watershed management strategies

Outcome #1**1. Outcome Measures**

Development of metrics for greenhouse gas emissions in agriculture.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

International and national governing bodies, agricultural industries, producers, and agricultural supply chains are affected by the consequences of climate change. State-level agricultural producers will be facing greenhouse gas emission limits and changing water availability.

What has been done

CARS has initiated four LCAs for agriculture in the past two years that are comprehensive and detailed. These include liquid milk, cheese, pork, and poultry. The methods for addressing US agricultural GHG emissions have been developed.

Results

Dairy results suggest that the highest sources of GHG in the supply chain is grain production.

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
405	Drainage and Irrigation Systems and Facilities
605	Natural Resource and Environmental Economics

Outcome #2**1. Outcome Measures**

Life Cycle Inventory methodology and data for row crops for greenhouse gas.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

We are developing methods for LCA for agriculture that reduce uncertainty and variability in the analyses.

What has been done

LCA methods for grains, dairy and meet have been developed.

Results

The results will be published in 2010 in peer-reviewed journal articles.

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
405	Drainage and Irrigation Systems and Facilities
605	Natural Resource and Environmental Economics

Outcome #3**1. Outcome Measures**

Reduction of impact of row crop agriculture in the US on biodiversity.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	650000

3c. Qualitative Outcome or Impact Statement**Issue (Who cares and Why)**

Land use change is dramatically reducing habitat for critical species. Biodiversity is enhanced with improved land use effectiveness.

What has been done

We analyzed watershed impacts at 6, 13, and 14 digig HUC levels across the US (more than 600 watersheds) to determine the impact of tillage, cropping system, and other practices on benthic macroinvertebrate communities in streams.

Results

Agricultural impacts on stream biodiversity are decreasing over time and space, as conservation tillage practices are adopted.

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
405	Drainage and Irrigation Systems and Facilities
605	Natural Resource and Environmental Economics

Outcome #4

1. Outcome Measures

Integrated watershed management strategies

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2009	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Watersheds are the minimum of ecosystem management. Ecosystem services must be managed at the landscape scale.

What has been done

We have developed integrated metrics for watershed management.

Results

Ecosystem services have been assessed across many agricultural landscapes.

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
405	Drainage and Irrigation Systems and Facilities
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Other (Global Climate Change)

Brief Explanation

Rainfall practices and temperature regimes affect agricultural practices.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- During (during program)
- Time series (multiple points before and after program)
- Case Study
- Comparison between locales where the program operates and sites without program intervention

Evaluation Results

Data collection for this project is predominantly process-based from industries and from agricultural sectors. These data are aggregated into a metadata analysis to provide sector-based estimates of ag GHG emissions.

Key Items of Evaluation

Development and implementation of greenhouse gas (GHG) estimates from agricultural supply chains requires a retrospective assessment of the activities associated with production of an agricultural product, inventorying current activities, and analysis of case studies for validation of the analyses. Innovations for reducing GHG emissions requires comparisons by regions.