2010 Kansas State University Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

K-State Research and Extension's statewide presence lends itself to collaborative efforts with local groups, state and federal organizations, and colleagues in other states. Our faculty and staff consistently look for more and better ways to reach out to Kansas' increasingly diverse population. In addition to traditional one-on-one methods of communication, they use technology to deliver research-based programs to clients across the state and beyond. Top-notch research facilities and quality faculty draw businesses and funding to K-State and to Kansas. Several high-profile projects are under way in the Biosecurity Research Institute, and infrastructure development for the National Bio and Agro-Defense Facility is in progress.

The land-grant university system has a three-part mission of teaching, research, and extension that we refer to as learning, discovery, and engagement. To accomplish our mission, we must achieve a private and a public good from all our endeavors. We continually evaluate our programs to ensure we are making the best use of our resources and reaching out to Kansas citizens. We have many more tools because of technology, but the purpose has not changed to serve the wants, desires, needs, and dreams of Kansas' citizens. We have established valuable partnerships around the state, the nation, and the world. We accomplish our goals when we have positive impact on individuals, but our ultimate goal is achieved when we also provide social impact. We view new discoveries and engaging people we serve as benefiting both individuals and society.

K-State Research and Extension is reaching out in new ways to new audiences, while still serving our traditional clientele. Here are a few examples:

The PRIDE community development program celebrated 40 years in existence in 2010. PRIDE is not an acronym, but the name of the community improvement program that functions in cooperation with the Kansas Department of Commerce with shared staff and financial support. Over the years, more than 400 Kansas communities in effectively every Kansas County have benefited from commitment and involvement in the PRIDE program. PRIDE provides structure and guidance to organize and connect with all the resources of a community in planning, development, and actions. Serving 70 communities in 2010, the PRIDE program generated $723,606, invested 171, 036 volunteer hours, and collaborated with 592 partners to complete 1,183 community improvements.

Kansas State University has rapidly become noted as a military-friendly university and K-State Research and Extension plays a key role. Our military partnering includes staffing an Extension office on the Fort Riley post. This office is partnering with government agencies to offer services to military families before, during, and after troop deployments. Areas of emphases include financial literacy, nutrition and diet for young families, strengthening family relations in a stressful military environment, and using gardening and horticultural work as therapy for stressed military families.

The demographics of Kansas have changed and will continue to change. K-State Research and Extension is reaching out to both underserved and traditional audiences through new venues. Educational programming is having an impact on new immigrants by helping them to assimilate into local communities, find the resources of their cultural interest, and understand how cultures differ in the community.

Kansas 4-H has a long tradition of training leaders for the future. The Citizenship in Action program encourages teenagers to learn more about how government functions and how to actively participate in the legislative process. Also, the 4-H SET program focuses on preparing more youth who are proficient in science, engineering, and technology. Youths are learning skills in such areas as global positioning systems and computer interface.

Research on biofuels is another important topic for Kansans--those who will use biofuels to heat their homes and those who produce the crops that are converted to fuel.

Kansans are benefiting from research in nutrigenomics, a field that studies the effects of food on gene expression has the potential to use food instead of medication to combat problems like high cholesterol. Consumer education is also an important factor for the future of nutrigenomics and public health for all Kansans with the increasing incidence of obesity and chronic diseases such as type 2 diabetes.

We are effectively using our statewide network of offices to share research-based information related to the environment, families, communities, and production agriculture.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	400.0	0.0	255.0	0.0
Actual	422.0	0.0	266.0	0.0

II. Merit Review Process

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

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

2. Brief Explanation

All new and renewing K-State Research and Extension Action Plans/Projects undergo a review process coordinated locally at the department or unit level, with input, as needed or requested from the experiment station grants and contracts office. Department heads and unit leaders are given latitude to employ strategies for evaluation of new plans and projects for their scientific merit and their relevance to programmatic focus. Guidance is provided to unit heads and unit leaders regarding the process by which review may take place. Most employ a panel of on-campus reviewers; many use a combination of on and off-campus expert reviews; and a few choose to utilize completely external off-campus review. This past year, at least two model review outlines were made available for review of new and continuing projects. Department heads and unit leaders could utilize these review templates as written or add/modify elements of the review to fit unique nuances specific to their respective discipline or to accommodate special input from stakeholders. When reviews are complete, the Department Head or Unit Leader meets with the applicant(s) to discuss the reviews and identify necessary revisions. A final revised version of the proposal

is reviewed by the Associate Director for Research and/or Extension, and approved as appropriate for final review by National Program Leaders at USDA/NIFA. This process ensures that action plans adequately and appropriately address issues that make a positive difference in the lives of stakeholders. On a regular basis, as projects are conducted, investigators and team leaders meet with stakeholders from all sectors to validate the goals, objectives, and on-course progress of the program. This process does not change from year to year.

III. Stakeholder Input

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

- Survey of traditional stakeholder groups
- Survey of selected individuals from the general public

Brief explanation.

K-State Research and Extension is rich with advisory panels, teams, councils, and committees through every discipline of research and extension work. In Kansas, local Cooperative Extension is organized with elected Program Development Committees (PDCs). Individuals throughout the community are targeted to seek election for their experience and interest broadly in needs and issues of agriculture, family, youth, and community. Six individuals are elected to each of the four committees in all counties across the state. This equates to roughly 2500 private citizens taking an active roll as stakeholders in setting programmatic priorities for extension programming at the local level. Each year, the individuals involved in leadership activities of these local councils is invited to a one-day training and dialog event at four locations across Kansas. This day-long meeting includes updates on their roles and responsibilities as stakeholders for the extension program.

In 2009, a system-wide survey was conducted to focus on issues of agreed importance for which K-State Research and Extension must focus. Stakeholders from all 105 counties in Kansas provided feedback and input into the prioritization process. The survey consisted of a series of seven strategic opportunities and several statements within each opportunity to describe the work plan focus. Stakeholders provided feedback on those statements as to their relative importance to Kansas. That process has resulted in areas of emphasis for our on-going research and extension plans. Every academic discipline and our outstate research and extension centers also operate with advisory groups. Those advisory groups are recruited through defined criteria to see that a broad set of interests and backgrounds are represented. Typically, advisories meet with administration and faculty once or twice annually to review progress on key initiatives and to gather input on future directions and priorities for the discipline or the center. Nothing new to report in 2010.

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 Surveys

Brief explanation.

Following are three examples of processes used to select advisories. First, the Director of K-State Research and Extension and Dean of the College of Agriculture has an advisory that is carefully selected through a nomination process. The individuals invited to serve are selected based upon the target audience represented, gender, race, ethnicity, and leadership. This group meets three times annually to review programs and provide advice to the Dean and Director on key initiatives to strengthen the programs in research, extension, and teaching. A second example is with the State Extension Advisory Council. This group is elected through their leadership on local

Extension Boards. Individuals are approached and encouraged to accept nomination to the process. Then their peers go through an election process to identify the representatives they wish to serve on this advisory. This advisory meets twice annually with the Extension director and the administrative team to identify priorities and opportunities to fulfill the mission. In our family programming areas, Program Development Committee (PDC) members were asked to identify people to survey that reflected the demographics of their communities, based on age, gender, race/ethnicity and income. They were asked to identify people that were not familiar with Extension as well as those who were. Each PDC member was asked to deliver a survey to six individuals. Those surveyed were asked to rate on a 1 to 5 scale the need for selected topics within their community. Completed surveys were received from more than 2,000 people and the results are being used locally and at the state level to prioritize work for the next few years.

We provide all of our Extension agents and local Executive Boards with a web-based training tool on techniques for recruiting new Board and PDC members to insure a diversity of interests and experiences with new members.

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 individuals
- Survey specifically with non-traditional individuals
- Survey of selected individuals from the general public

Brief explanation.

Stakeholder input is a continuous process across the breadth of programming for research and extension educational programs in an effective grass-roots organization like K-State Research and Extension. Stakeholder input happens through local, regional, state, multi-state, and national input processes. The stakeholder input process is a comprehensive effort to seek focus on critical issues and problems needing research and answers that fit well within our defined mission priorities. This input continues throughout planning, project implementation, and program delivery. Specifically, face-to-face meetings that include strategic planning, small group process, and reporting back to the recipient institution are commonly used. Nominal group processes are employed to assure hearing of all voices. With the State Extension Advisory Council, that group is given the task to seek input from others outside of the face-to-face meeting, and to bring that knowledge and experience to the meetings through their sharing of such input. In seeking specific input, we have employed telephone random survey processes to help us understand how well we market our information, education, and programs as an organization. This information goes into a strategic market planning process to help us to reach a broader clientele, especially minority and under-served audiences. We have stakeholder groups who focus on our non-traditional audiences and programming. Specifically, the Kansas Center for Sustainable Agriculture and Alternative Crops operates with an advisory council for the expressed purpose of providing input on projects and ideas across both research and extension. This group assists in identifying opportunities for directing seed grant funds to research and extension faculty to better reach nontraditional needs and audiences. The breadth of advisory groups giving input and sharing needs and ideas range from the traditional Dean's advisory council to advisories working through every academic department and research/extension center to every local Extension office. Within program areas, we have advisors made up of stakeholders in areas of family nutrition, meat science, food science, crop commodity groups, livestock commodity groups, agricultural bankers, and the list goes on. We estimate that at any given time K-State Research and Extension has formal relationships with more than 200 advisory stakeholder groups who provide continuous input and feedback on research and extension

initiatives, priorities, and direction. No new processes were employed in 2010.

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Action Plans
- To Set Priorities

Brief explanation.

K-State Research and Extension is rich with advisory panels, teams, councils, and committees through every discipline of research and extension work. In Kansas, local Cooperative Extension is organized with elected Program Development Committees (PDCs). Individuals throughout the community are targeted to seek election for their experience and interest broadly in needs and issues of agriculture, family, youth, and community. Six individuals are elected to each of the four committees in all counties across the state. This equates to roughly 2500 private citizens taking an active roll as stakeholders in setting programmatic priorities for extension programming at the local level. Each year, the individuals involved in leadership activities of these local councils is invited to a

Brief Explanation of what you learned from your Stakeholders

Extension stakeholders continue to indicate appreciation and desire for greater specialization and more focused programming for high impact. Expressing the public value of the work of extension through outcomes is vital to keeping public funding strong. Our strategic opportunities are well focused on local priorities.

On the research side, K-State Research and Extension entered into a new collaboration around wheat variety development with a private company. This is significant in that private investment in wheat has lagged significantly behind corn and soybeans until 2010. Prior to the signing of the agreement, numerous public stakeholder meetings were held to gain input from growers, the seed and milling industry and other interested parties around the terms of the agreement. In the end, representatives of the Kansas Wheat Alliance, the Kansas Association of Wheat Growers and the Kansas Wheat Commission signed confidentiality agreements that allowed them to view and comment on the terms of the agreement. In the end, stakeholders valued the opportunity to assist in crafting an agreement designed to benefit the wheat industry.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
5440191	0	3900073	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	3331244	0	3404161	0
Actual Matching	12683054	0	31492665	0
Actual All Other	20482020	0	5805329	0
Total Actual Expended	36496318	0	40702155	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	1859442	0	1051814	0

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Competitive 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
201	Plant Genome, Genetics, and Genetic Mechanisms	5%		10%	
205	Plant Management Systems	29%		14%	
216	Integrated Pest Management Systems	5%		10%	
307	Animal Management Systems	37%		19%	
311	Animal Diseases	0%		24%	
501	New and Improved Food Processing Technologies	2%		2%	
502	New and Improved Food Products	0%		1%	
511	New and Improved Non-Food Products and Processes	2%		1%	
601	Economics of Agricultural Production and Farm Management	19%		14%	
603	Market Economics	1%		0%	
606	International Trade and Development	0%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	108.0	0.0	175.0	0.0
Actual	118.0	0.0	194.0	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**
1666706	0	2482273	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
6165526	0	22968801	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
2923200	0	4233929	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Evaluate and develop technologies and production strategies that will enhance production efficiencies and industry profitability.
• Assist producers in improving the economic efficiency of crop and livestock production enterprises and the marketing of products through research and educational programs.
• Conduct research to improve productivity, reduce costs, reduce nutrient output on livestock waste, improve profitability, and increase production of safe, wholesome, and nutritious products.
• Increase producers understanding of their role in producing a wholesome, safe food product.
• Improve the yielding ability and quality of the agronomic crops uniquely adapted to Kansas and the Central Plains, through plant breeding and genetics.
• Develop integrated, sustainable cropping systems, which will enhance the intensity, diversity and profitability of crop production.
• Improve resource use efficiency (water, soil and inputs) within diverse and sustainable cropping systems.
• Enhance the development of the horticulture industry in Kansas. Manage afforestation and reforestation of Kansas to promote biodiversity, wildlife habitat and forest products.
• Contribute to the development of extensive and intensive animal production and management systems that are economically viable, ecologically sustainable, and compatible with safe and humane treatment of animals.
• Conduct applied research and educational programs, which will assist managers in assessing risk and developing risk management strategies for their farm, ranch, or agribusiness.
• Develop decision support systems to meet the needs of large- and small-scale farmers and agribusinesses.
• Conduct applied research and educational programs, which will assist agribusiness managers, including producer-owned cooperatives, improve the profitability and sustainability of their businesses.
• Provide tools and education for improved farm-level record keeping and analysis, including whole-farm and enterprise analysis and benchmarking.
• Develop tools and educational programs to assist producer groups in evaluating bio-fuel alternatives.
• Develop and disseminate economic-based information that will facilitate business development focused on value-added marketing and processing of agricultural products.
• Increase awareness of value of biobased products in the commercial marketplace.
• Develop new processes to modify agricultural-based materials into higher value products.
• Assess constraints and value opportunities for Kansas agricultural goods.
• Increase food variety and value by developing new and enhanced food products.

2. Brief description of the target audience

Farm and ranch managers; agricultural producers and agribusinesses throughout the food industry supply chain with emphasis on producers who want to help themselves; people who influence producers and producer decisions, including educators (veterinarians, media, industry organizations, packers/purchasers); government agencies/ regulators; the lending industry; and policy makers. Growing industry based on bioprocessing and bioconversion, including the existing ethanol and biofuels industry. International grain processors; industrial products manufacturers: adhesives, composites, bio-based chemicals, solvents, and lubricants. Entrepreneurs and investors seeking to enter this industry.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	26300	0	1100	0

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

Patent Applications Submitted

Year: 2010

Actual: 6

Patents listed

Soy Protein Based Elastomers and Method of Making the Same;
Red Yeast Fermentation to Produce Natural Astaxanthin and B-Carotene Enriched-Fish Meal; Leishmania Major Vaccine; Menthol and Related Compounds as Anabolic Agents in Livestock; Novel Protein Peptides Hydrogels Composition and Properties; Method of Manufacturing Proteins with Improved Nutritional Value for Ruminants

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	22	43	65

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of individuals participating in programs

Year	Actual
2010	16902

Output #2

Output Measure

- Number of new/improved varieties, inbreds, germplasm developed and released

Year	Actual
2010	0

Output #3

Output Measure

- Number of educational events (e.g., meetings, demonstrations, field days, press releases, and distributed publications) delivered

Year	Actual
2010	644

Output #4

Output Measure

- Number of producers engaged in one-on-one consultations through Kansas Farm Management Association or Farm Analyst programs

Year	Actual
2010	3046

Output #5

Output Measure

- Number of presentations at national and international conferences

Year	Actual
2010	175

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participating livestock producers who demonstrate best management practices (BMPs) in regard to management and production, including genetic selection, reproduction, nutrition, health, animal care and well-being, livestock safety and quality, environmental management, and optimal marketing strategies
2	Number of Kansas farms and ranches increasing awareness of financial performance
3	Number of acres planted to KAES-developed materials or materials derived from KSU varieties, inbreds, or germplasm
4	Number of crop acres using soil testing as a basis for nutrient applications
5	Percent of producers demonstrating improvement of Kansas ground and surface water with respect to nutrient loads
6	Number of soil samples evaluated on Kansas crop acreage
7	Changes in average or typical observed cropping systems, rotations, and crops
8	Hours and activities reported annually by Master Gardener volunteers
9	Number of new processes to improve utilization of biological raw materials as bioconversion substrates
10	Number of participating cow/calf producers who lower cow feed supplement costs through use of BRaNDS software to make informed, cost-effective purchase decisions.
11	Improve utilization of biomaterials from Kansas agriculture

Outcome #1

1. Outcome Measures

Number of participating livestock producers who demonstrate best management practices (BMPs) in regard to management and production, including genetic selection, reproduction, nutrition, health, animal care and well-being, livestock safety and quality, environmental management, and optimal marketing strategies

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	700	810

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Livestock producers are adjusting to a new reality. Feed, fuel, and other input costs are establishing new benchmarks after breaking through previous historical highs. Fortunately, livestock prices are also establishing new records in the pork, beef, goat, and sheep markets. After a few years with major losses, the dairy industry has also rebounded. These new price points in the livestock marketed have increased the importance of reproductive importance and health management for reduced mortality due to the high value of animals at market. High productivity is also required to spread the higher production costs over as many animals as possible. Livestock producers continue to become more specialized and in turn, rely increasingly on experts for answers to their questions as their personal knowledge level increases.

An issue that emerged in 2010 that impacted numerous livestock producers in Kansas and other Midwest states was the poor quality of the 2009 corn crop. Corn had high levels of deoxynivalenol (DON) and aflatoxin which reduced livestock performance, caused increased mortality. Products are sold to mitigate mycotoxin contamination, but research on those products has been limited.

What has been done
Researchers at Kansas State University conducted numerous trials with alternative feed ingredients for swine, dairy, and beef cattle. We also tested numerous products aimed at reducing the impact of mycotoxin (DON) contaminated corn on livestock production and determined that one product (Defusion) was efficacious with no benefit to any of the other products tested. Results of these research projects were distributed to producers through livestock magazines, popular press, meetings, and through one-on-one consultation. Extension specialists and local

agents also worked with producers to incorporate alternative ingredients and with testing of feed ingredients for mycotoxin contamination.

Results

Livestock producers that attended beef and swine meetings were surveyed to determine the value of information received. Of those surveyed, 91% indicated that they would likely make changes to their operation based on information that they received at the meetings. Producers benefiting from these meetings represent all sizes and types of operations. Of the beef producers surveyed, the majority of attendees owned cow herds with 19% owning more than 200 cows, 23% owning 100 to 200 cows, 27% owning 50 to 100 cows and 30% owning less than 50 cows. The stocker and feedlot owners ranged from smaller operations with less than 500 head to larger owners with over 3,000 head. More than 75% of the producers attending the meetings indicated that the information received would have a major financial impact on their business. Information disseminated by K-State Research and Extension will continue to help livestock producers address the ongoing challenge presented by high feed cost.

Livestock producers learned methods to limit the impact of mycotoxin contamination from the 2009 corn crop by testing to determine levels in grain, using alternative ingredients or alternative grain sources to dilute levels, and mycotoxin-binding products that demonstrated efficacy in the research trials.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Measures

Number of Kansas farms and ranches increasing awareness of financial performance

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3000	3161

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The state of the economy, along with volatile commodity and input prices, make business planning in agriculture increasingly difficult and raises the stakes of each decision a producer must make. Having good information on which to base decisions is critical for producers to remain profitable and sustainable for the future. Education, training and assistance in keeping good records and in the appropriate methods to analyze and use those records will provide the needed knowledge to make informed decisions.

What has been done
The goal of the Kansas Farm Management Association (KFMA) program is to provide each member with farm business and family financial information for improved farm business organization and decision making so that Kansas farms can minimize risk while they increase sustainability and profitability. Making the information available publicly can help to accomplish the same for many involved in agriculture in Kansas and around the country in addition to the KFMA membership. Activities in 2010 included: 7,795 face to face meetings with 3,046 producers; 57 presentations to 1,330 individuals; 1,949 farm business analyses; 3,830 individual crop and livestock enterprise analyses; 11 radio interviews; three television interviews; numerous newsletter and newspaper articles; presentation to more than 150 students in classes at KSU; close to 26,000 hits to KFMA Newsletter on website; and more than 120 cash flow analyses with FinPack.

Results
Through one-on-one consultations 3,161 Kansas producers increased awareness of their current financial position and their financial performance during the past year. Of these producers 1,949 are able to benchmark their performance against other farms in their region; farms of similar type; as well as, the most economically profitable farms. This allows these producers to identify strengths and weakness in their operation and to take action to build on the strengths, and address the weaknesses, vastly increasing the operation's sustainability and profitability for the future. Through enterprise analysis these operations have also identified those enterprises that are the most profitable and they clearly understand their cost of production for each enterprise allowing them the opportunity to make informed marketing decisions when selling the products they have produced. Additionally, more than 100 producers in poor financial condition, or with family conflict, improved understanding of how to address their situation in a sustainable manner.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Measures

Number of acres planted to KAES-developed materials or materials derived from KSU varieties, inbreds, or germplasm

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	6500000	6350000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Kansas Agricultural Experiment Station (KAES) develops new varieties and releases improved germplasm of wheat, soybeans, grain sorghum and canola. New varieties can benefit Kansas farmers directly and new germplasm gives other breeders, and ultimately farmers the advantage of KAES research.

What has been done
No new varieties were released in the past year, but new lines were increased to usable quantities in anticipation of release. Lines are screened for resistance to current and potential abiotic and biotic factors.

Results
KAES varieties and germplasm are used extensively by Kansas farmers either directly from a KAES developed variety or indirectly from enhanced germplasm in varieties or hybrids developed by other entities. A majority of the wheat acres in Kansas is planted with KAES varieties or varieties developed with KAES germplasm.

4. Associated Knowledge Areas

KA Code	Knowledge Area
201	Plant Genome, Genetics, and Genetic Mechanisms

Outcome #4

1. Outcome Measures

Number of crop acres using soil testing as a basis for nutrient applications

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	4000000	3300000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Fertilizer represents a significant portion of the Input dollars spent by Kansas farmers. Too little applied, especially N, P and K, can reduce yields, while too much applied can lead to potential enrichment of surface and ground water. Soil testing is a valuable tool for optimizing fertilizer applications.

What has been done
During the 2008-2010 crop years a number of field experiments were conducted to evaluate N fertilizer products, specific additives designed to reduce N loss and methods of fertilizer application for corn, sorghum, soybeans and wheat.

Results
The results from this applied research show some marked differences in the performance of products and application methods designed to reduce N loss when conditions conducive to loss are present. However where these products performed was influenced by soil, rainfall quantity and intensity, and cropping system. Publications are under development to help Kansas farmers better understand where and when these conditions are likely to occur.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #5

1. **Outcome Measures**

Percent of producers demonstrating improvement of Kansas ground and surface water with respect to nutrient loads

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

Number of soil samples evaluated on Kansas crop acreage

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

Changes in average or typical observed cropping systems, rotations, and crops

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Hours and activities reported annually by Master Gardener volunteers

2. **Associated Institution Types**

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	85000	95871

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Extension Master Gardeners are a vital part of K-State Research and Extension. Donating time in return for horticultural training, Extension Master Gardeners help Extension agents meet the need for horticultural information in their communities. The Master Gardener program is designed to provide trained volunteers to help meet that need at minimal cost.

What has been done
The means of providing this information is diverse including horticultural "hotlines," demonstration gardens, working garden shows, public presentations and providing tours. Extension Master Gardeners require continual education in best management practices, conservation of natural resources, waste management, integrated pest management, and identification and selection of proper plant materials for healthy people, plants, and the environment.

Results
Extension Master Gardeners donated more than 95,000 hours with a value over $1.7 million in 2010. Though most Kansas EMG groups only require 40 hours of volunteer time the year of training and less for every year thereafter, our EMGs averaged more than 79 hours of volunteer time during 2010. This level of enthusiasm and commitment not only impacts our volunteer projects but often results in our EMGs influencing family, friends and neighbors to use proven horticultural practices. Homeowners sometimes over-fertilize and often misdiagnose problems in their landscape and garden resulting in overuse of unneeded or ineffective products. By providing timely, accurate information, our Master Gardeners influence our clientele to use less and more effective inputs resulting in better results and a savings of time and money. Using less fertilizers and pesticides also helps protect the environment.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems

Outcome #9

1. Outcome Measures

Number of new processes to improve utilization of biological raw materials as bioconversion substrates

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1	3

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The U.S. consumes more than 140 billion gallons of transportation fuels annually. Due to finite reserves, non-uniform distribution, and volatile prices of fossil fuels, renewable fuels from biomass could make a significant contribution toward a more sustainable future. Recent legislation has called for this nation to annually produce 36 billion gallons of renewable fuel by 2022 to help offset impending concerns over climate change and energy security. Such targets have implications of national security, economic development, and sustainable practices for the future.

What has been done
Both fundamental and applied research has been conducted in the area of biofuel production. Key projects include 1) grain sorghum, sorghum biomass and sweet sorghum as a viable renewable resource for biofuels; 2) pelleting forages to increase cellulosic ethanol production; 3) syntheses of acid functionalized nanoparticles for hydrolysis and pretreatment of lignocellulosic biomass; 4) microalgae biorefining for biofuels; 5) biomass gasification for value-added utilization of agricultural residues; and 6) pyrolysis of biomass for bio-oil and bio-char production. These research projects were supported by NSF, USDA, DOE/USDA, DOT Sun Grant Initiative, United Sorghum Checkoff Program, and State of Kansas.

Results
We indentified that waxy sorghum with low energy input during hydrolysis and less time required for fermentation is an excellent feedstock for bioethanol production; photoperiod sensitive sorghum with high soluble sugar content has a great potential to produce large quantity of biofuel; and the major factors affecting the quality of sweet sorghum juice under different processing and storage conditions. In addition, we studied the physical and chemical properties of biomass pellets, established method for synthesis of acid-functionalized nanoparticles for biomass pretreatment and hydrolysis, and optimized processing conditions for biomass gasification and hydrothermal pyrolysis for specific biomass feedstocks as well as for algae oil extraction.

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes

Outcome #10

1. Outcome Measures

Number of participating cow/calf producers who lower cow feed supplement costs through use of BRaNDS software to make informed, cost-effective purchase decisions.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	450	380

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Beef producers have been facing continually rising feed costs, an increasing number of byproducts, and access to more nutritional information about their ingredients. The challenge is for producers to consolidate this information into decisions on how to use the feed ingredients and knowledge to implement practical feeding programs that they can use on their farms and ranches. Feed cost represents 50 to 80% of the cost of production for livestock producers. Thus, tools to lower feed cost while meeting nutritional requirements have been needed.

What has been done
In a partnership with Iowa State University, we made BRaNDS, a beef ration formulation package, available to all extension agents in Kansas with a livestock interest. Trainings were conducted to increase agent comfort level in using this tool to help beef producers lower their feed cost with prudent, effective supplementation programs and forage management systems. Specialists and agents worked one-on-one with local producers to use this program to lower feed cost. Several veterinarians also adopted BRaNDS as a tool in their clinics and provided services to beef producers to lower their feed costs.

Results
BRaNDS has been used with beef producers to lower their feed costs and to examine alternative ingredients. As examples, several producers were able to incorporate wet DDGS (Dried Distillers Grains with Solubles) into their operation to save $1,200 to 10,000 on their feed cost. Some producers learned that their existing feeding program and home-raised for age was adequate to meet the needs of their cows and purchased ingredients were not needed. Some producers learned that their mineral supplement needed to be altered to meet the requirements of their cows for Increased reproductive performance. BRaNDS provided a tool for agents, specialists, and veterinarians to make a direct financial impact on the businesses of beef producers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #11

1. Outcome Measures

Improve utilization of biomaterials from Kansas agriculture

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	2

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The U.S. consumes more than 140 billion gallons of transportation fuels annually. Due to finite reserves, non-uniform distribution, and volatile prices of fossil fuel, renewable fuels from biomass could make a significant contribution toward a more sustainable future.

What has been done
Bioprocessing and Industrial Value Added Program (BIVAP) serves as a focal point for grain processing research on campus and plays a leadership role through other organizations. The Bio-Materials and Technology Lab, one of the key laboratories of BIVAP, is a multifunctional lab with the capability to perform characterization and processing research for various bio-based materials. Projects included researchers from several departments (i.e., Chemical Engineering, Food Science, Human Nutrition, Ag Economics, as well as Grain Science).

Results
Improving utilization of biomaterials from Kansas agriculture has many positive benefits. It adds value to the crops grown in the state. It will improve the rural economy from this added value. It can provide economic rural development when new manufacturing facilities are located in smaller rural communities. It improves the efficiency and sustainability of our society and reduces reliance on foreign petroleum.

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes
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 (Technological change)

Brief Explanation

{No Data Entered}

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

Evaluation Results

Key Items of Evaluation

Program Focus Teams (PFTs) are working with staff from the Office of Educational Innovation and Evaluation (OEIE). Self-assessment questions have been shared for PFTs to review their Action Plans. OEIE staff have been contracted to strengthen teams' understanding of the evaluation process and to help teams develop evaluation tools. We believe our beginning investment in evaluation will strengthen ability in PFTs, and across our K-State Research and Extension system.

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Safe Food and Human Nutrition

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	15%		15%	
703	Nutrition Education and Behavior	30%		20%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	15%		15%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	30%		30%	
723	Hazards to Human Health and Safety	0%		10%	
724	Healthy Lifestyle	10%		0%	
802	Human Development and Family Well-Being	0%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	112.0	0.0	17.0	0.0
Actual	114.0	0.0	24.0	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**
236018	0	307296	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
945338	0	2841288	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
9087040	0	523800	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Develop new rapid methods for the surveillance, detection, isolation, and quantification of microbes and chemical residues in animals, plants, and food products. • Develop risk monitoring techniques to detect potential hazards in the distribution chain. • Validate the efficacy of techniques in controlling and eliminating microbial and chemical hazards. • Disseminate food safety and bio-security information through extension and research seminars, workshops, and resident and distance education programs, using a variety of media options and communication tools. • Offer safe food production, handling, and sanitation education to groups involved in all levels of food production and service. • Identify best management practices to prevent foodborne illness and to enhance the security of the food supply throughout the food chain. • Develop technology to reduce the hazards and improve the quality of animal food products, which will complement the development of HACCP programs by USDA. • Develop, complement, and maintain an aggressive technology transfer system that effectively communicates work about Safe Food and Human Nutrition to consumers, students, industry, government, and other scientific investigations.

2. Brief description of the target audience

• Growers and processors of agricultural commodities, commercial and non-commercial food service personnel, market and home gardeners, other food handlers, retail markets, consumers, and educator; • Families and individuals of all ages living in Kansas, including populations with limited resources; low literacy skills; varying ethnicities; disabilities, diseases, or impairments; and documented or identifiable health disparities; • Economic stakeholders, and policy and funding agencies; • Health care, education, and nutrition professionals; • K-State Research & Extension faculty and staff with responsibilities for food and/or nutrition; • Government; and • Consumer groups (i.e., STOP).

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	637	0	350	0

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

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	18	18

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of rapid methods developed for the surveillance, detection, isolation, and quantification of microbes and chemical residues in animals, plants, and food products

Year	Actual
2010	2

Output #2

Output Measure

- Number of therapeutic, chemical, and physical treatments developed for animals and plants and their products to eliminate or reduce contamination with potential hazards

Year	Actual
2010	4

Output #3

Output Measure

- Number of ServSafe certification workshops

Year	Actual
2010	14

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants demonstrating increase in knowledge level and attitude of clientele in safe food production, handling, and sanitation programs; best management practices to prevent foodborne illness; and social, economic, and communications issues related to food safety and agricultural bio-security
2	Percent of participants in food service manager certification class who successfully complete the exam.
3	Number of food service employees who complete employee level food safety course.
4	Number of foodservice facilities with trained employees

Outcome #1

1. Outcome Measures

Number of participants demonstrating increase in knowledge level and attitude of clientele in safe food production, handling, and sanitation programs; best management practices to prevent foodborne illness; and social, economic, and communications issues related to food safety and agricultural bio-security

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Percent of participants in food service manager certification class who successfully complete the exam.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	300	80

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The National Restaurant Association has estimated that the average cost of a foodborne illness outbreak to an establishment is about $75,000. The economic value of foodservice educational programs can be calculated by multiplying the number of establishments reached through the programs by the estimated economic burden of an outbreak ($75,000).

What has been done
KSRE in collaboration with the Kansas Restaurant and Hospitality Association (KRHA) provided ServSafe Training in Kansas during January-December 2010. Two of the 2010 ServSafe classes offered were conducted in Spanish to reach out to Spanish speakers in the foodservice industry

Results
Two hundred sixty-five (265) foodservice employees completed the training, which extends knowledge gain beyond the 212 passing the certification exam. In addition, 21 extension professionals received training and/or technical help to establish or maintain professional ServSafe certification and/or licensing to be qualified to teach the ServSafe Certification Course.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Number of food service employees who complete employee level food safety course.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	250	372

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Food safety education is necessary to help maintain health care cost, and to help ensure public health and maintain quality of life for all Kansans.

What has been done
In 2010, KSRE provided more than 72 contact hours of food safety entry-level training. Twenty-one ServSafe Employee Level classes were conducted in 18 counties training 372 entry level foodservice employees. The employee level classes provide an end-of-session assessment of knowledge gained.

Results
Participants indicated that they had increased knowledge and skills of best food safety practices. More than 90% of the participants indicated they plan to use what they learned at work and/or at home. Participants reported they intend to wash their hands, check food temperatures, increase the use of thermometers and be more cautious of cross contamination and food left out at room temperature. Seventy-five percent of ServSafe participants indicated they improved their food safety knowledge and plan to adopt new practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and

Naturally Occurring Toxins

Outcome #4

1. Outcome Measures

Number of foodservice facilities with trained employees

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	157

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The National Restaurant Association has estimated that the average cost of a foodborne illness outbreak to an establishment is about $75,000. The economic value of foodservice educational programs can be calculated by multiplying the number of establishments reached through the programs by the estimated economic burden of an outbreak ($75,000).

What has been done
In 2010, K-State Research and Extension/Kansas Restaurant and Hospitality Association (KSRE/KRHA) trained employees from 157 Kansas foodservice operations.

Results
In 2010, 157 facilities reported having ServSafe trained employees which translates to a huge economic value considering the estimated cost of a foodborne illness outbreak per establishment! The public value of food safety best practice training is that Kansans are provided a safer dining environment, as well as the potential for fewer hospitalizations, reduced medical cost, fewer days of work missed due to illness, and increased productivity.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
723	Hazards to Human Health and Safety

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

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

Evaluation Results

Key Items of Evaluation

Program Focus Teams (PFTs) are working with staff from the Office of Educational Innovation and Evaluation (OEIE). Self-assessment questions have been shared for PFTs to review their Action Plans. OEIE staff have been contracted to strengthen teams' understanding of the evaluation process and to help teams develop evaluation tools. We believe our beginning investment in evaluation will strengthen ability in PFTs, and across our K-State Research and Extension system.

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Natural Resources and Environmental 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
102	Soil, Plant, Water, Nutrient Relationships	15%		15%	
111	Conservation and Efficient Use of Water	30%		30%	
112	Watershed Protection and Management	30%		20%	
121	Management of Range Resources	15%		20%	
141	Air Resource Protection and Management	10%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	30.0	0.0	44.0	0.0
Actual	30.0	0.0	23.0	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
328810	0	294492	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1202640	0	2722901	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
1730290	0	501975	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Understand the sources, fate, and transport of important water contaminants (i.e., fecal coliform bacteria, nutrients, sediment, and pesticides [especially atrazine herbicide]), and develop and determine the environmental and economic effectiveness of best management practices for these potential contaminants.

• Disseminate science-based information through environmental education programs for both youth and adults, and deliver extension programs aimed at stakeholders that focus on adoption of best management practices in targeted areas for water quality improvement.
• Develop and test new crop, livestock, bioenergy, and riparian forest systems that will reduce water use while optimizing productivity, environmental quality, and profitability, including water saving technologies for concentrated animal feeding operations (CAFOs) and industries that process agricultural commodities.
• Develop an information and education program for policy makers, producers, water professionals, and youth audiences with respect to the Ogallala Aquifer, including assessment of the potential impacts of climate change on this important water resource.
• Develop science-based emission factors for dust and ammonia at beef cattle feedlots, that include understanding the conditions under which high emissions occur and the animal health effects associated with high emissions.
• Develop an understanding of air quality impacts of rangeland burning, including extent and timing of burn events, influence of fuel load on emissions, modeling the downwind transport of particulate matter, and developing a climatology of extreme events.
• Determine the community level impacts of biofuel production and processing.
• Determine the impacts of cellulosic ethanol production on land use, soil conservation and quality, and water conservation and quality.
• Determine the economic impacts and trade-offs associated with biofuel production and processing based on both grain and cellulosic ethanol.
• Disseminate science-based information regarding the sustainability of biofuel production and processing.

2. Brief description of the target audience

Agricultural producers, youths, policymakers/regulators, crop and livestock consultants

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	10500	0	1500	0

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

Year: 2010
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	16	12	28

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs delivered

Year	Actual
2010	25

Output #2

Output Measure

- Number participating in educational programs

Year	Actual
2010	2000

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of producers adopting BMPs that protect environmental quality
2	Number of acres of BMP adoption for atrazine and soil erosion
3	Measurable improvement in water quality in Little Arkansas River (Measured by percent reduction atrazine)

Outcome #1

1. Outcome Measures

Number of producers adopting BMPs that protect environmental quality

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	90	90

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Restoring water quality requires a fundamental change in practices and behavior toward the land and water. Behavior change in agriculture with respect to improving water quality involves raising awareness of issues and problems, identifying options for action, securing technical and financial assistance, and implementing change.

What has been done
Best Management Practices (BMPs) were delivered through 100 workshops, demonstrations, and tours; 23 field days; and 73 public meetings to 9,000 face-to-face contacts. In addition, 335 on-farm environmental assessments and plans were developed.

Results
BMPs such as adding grass buffers, reducing livestock numbers, adding waste storage facilities, controlling extraneous drainage, and alternative water sites for water quality issues were implemented by 111 individual producers involving more than 23,103 animal units. BMPs were implemented involving more than 14,991 acres of cropland on 90 farms.

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
121	Management of Range Resources
141	Air Resource Protection and Management

Outcome #2

1. Outcome Measures

Number of acres of BMP adoption for atrazine and soil erosion

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10000	27810

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The Little Arkansas River watershed is located in central Kansas. Total Maximum Daily Loads (TMDLs) are required for 52% of stream segments and 50% of lakes. The most common pollutants are fecal coliform bacteria, excess nutrients, atrazine herbicide, and sediment and total suspended solids.

What has been done
A 9-element watershed plan was developed by local watershed stakeholders, who determined the top priorities for implementation were to reduce atrazine herbicide and sediment delivery in surface waters. Three watersheds were targeted for rapid implementation of best management practices (BMPs) for atrazine herbicide. An education and demonstration program, surface water monitoring plan, and incentive program for atrazine BMP implementation were developed and delivered to the targeted watersheds. Twenty educational meetings were conducted to train 617 farmers and pesticide dealers. An atrazine BMPs publication was developed and distributed. BMP demonstration/research sites were developed at three farmer field sites to study and demonstrate the effectiveness of BMPs for pesticides, sediments, and nutrients. The city of Wichita and state agencies provided $80,000 in funding for incentive payments to farmers for implementing atrazine BMPs. Payments were based on the amount of pollutant reduction practices the farmers were willing to implement. A KSU extension agronomist made 100 on-farm visits to get farmers' commitment to implement atrazine BMPs. Watershed GIS maps and modeling were used to select a subwatershed for targeted BMPs adoption efforts to reduce sediment delivery. Using funding from a NRCS CIG grant ($450,000), a BMP implementation training and incentive program was developed.

Results

Atrazine BMP Implementation: 95 farmers implemented atrazine BMPs on a total of 23,000 corn and grain sorghum acres. An automated surface water monitoring system was installed in the streams at the base of the watersheds targeted for BMP implementation and also at the base of two adjoining watersheds. Water quality monitoring of treated and untreated watersheds found 51% lower atrazine concentrations, in streams in targeted watersheds in which BMPs had been implemented.
Sedimentation BMP Implementation: Outcomes included 25 farmers committing to implementing BMPs on 138 crop fields (4,810 acres) resulting in a reduction in annual sediment delivery to streams in the watershed from 9,219 tons to 2,926 tons.

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
121	Management of Range Resources
141	Air Resource Protection and Management

Outcome #3

1. Outcome Measures

Measurable improvement in water quality in Little Arkansas River (Measured by percent reduction atrazine)

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	51

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The most common pollutants in the Little Arkansas River watershed are fecal coliform bacteria, excess nutrients, atrazine herbicide, and sediment and total suspended solids.

What has been done

An education and demonstration program, surface water monitoring plan, and incentive program for atrazine BMP implementation were developed and delivered to the targeted watersheds.

Results
Water quality monitoring of treated and untreated watersheds found 51% lower atrazine concentrations, in streams in targeted watersheds in which BMPs had been implemented.

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

Evaluation Results

Key Items of Evaluation

Program Focus Teams (PFTs) are working with staff from the Office of Educational Innovation and Evaluation (OEIE). Self-assessment questions have been shared for PFTs to review their Action Plans. OEIE staff have been contracted to strengthen teams' understanding of the evaluation process and to help teams develop evaluation tools. We believe our beginning investment in evaluation will strengthen ability in PFTs, and across our K-State Research and Extension system.

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Healthy Communities: Youth, Adults and Families

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
724	Healthy Lifestyle	20%		10%	
801	Individual and Family Resource Management	10%		15%	
802	Human Development and Family Well-Being	15%		20%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	15%		15%	
806	Youth Development	40%		10%	
903	Communication, Education, and Information Delivery	0%		30%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	150.0	0.0	19.0	0.0
Actual	160.0	0.0	25.0	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**
1099710	0	320100	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
4369550	0	2959675	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
6741490	0	545625	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Develop/identify theory- and evidence-based educational programs to promote healthy communities: youth, adults, and families. • Disseminate, implement, and evaluate effectiveness of programs to promote healthy communities: youth, adults, and families.• Strengthen collaborative capacity within K-State Research and Extension and among communities/ organizations to promote healthy communities: youth, adults, and families. •Provide experiential learning opportunities for children and youth to address key and emerging issues that affect their growth and development. • Deliver and evaluate evidence-based community-development strategies for positive youth development in structured out-of-school settings (e.g., after-school programs, youth-serving organizations, clubs). • Strengthen the support for a volunteer development system through training and education on the experiential learning model, 4-H essential elements, ISOTURE model, age appropriate learning experiences and emerging aspects of youth development.

Note: ISOTURE: an extension model with tools for volunteer administration (Identification, Selection, Orientation, Training, Utilization, Recognition and Evaluation)

2. Brief description of the target audience

• Families and individuals of all ages living in Kansas, including populations with limited resources; low literacy skills; varying ethnicities; disabilities, diseases, or impairments; and documented or identifiable health disparities
• Economic stakeholders, and policy and funding agencies
• Health care and education professionals
• K-State Research & Extension faculty and staff with responsibilities for healthy communities: youth, adults, and families

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	20295	0	30140	0

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

Patent Applications Submitted

Year: 2010
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	5	0	5

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational programs delivered to increase knowledge of healthy communities: youth, adults, and families

Year	Actual
2010	1205

Output #2

Output Measure

- Number of program participants

Year	Actual
2010	62839

Output #3

Output Measure

- Number of educational programs to increase knowledge of volunteer development, ISOTURE, experiential learning and youth development competencies

Year	Actual
2010	1475

Output #4

Output Measure

- Number of communities that participate in community capacity building trainings and activities led through Extension.

Year	Actual
2010	60

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Percentage of participants who participate in regular physical activity
2	Number of substantial community projects that reflect shared participation in addressing community goals
3	Number of volunteer hours of community members engaged in community improvement programs
4	Number of volunteers, faculty and staff who understand and demonstrate the use of youth development competencies, life skills development, and the essential elements of a positive learning environment.
5	Number of youths who improve connectedness with parents, peers and other adults; improve their sense of social place/integration; improve attachments to prosocial/conventional institutions; express confidence in one's personal efficacy; demonstrate good emotional self regulation, coping, and conflict management skills.
6	Increased number of participants who have established financial goals to guide financial decisions toward financial security

Outcome #1

1. Outcome Measures

Percentage of participants who participate in regular physical activity

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	20

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Walking and other easily accessible physical activities are known to improve cardio-respiratory health, mental health/alertness and social connectedness in communities. Physical activity at recommended levels promotes overall health and well-being.

What has been done
Walk Kansas, one of KSRE's largest, sustained programs, contributes to the health and well-being of adults and children in nearly every county in Kansas. The 8-week physical activity campaign and team-challenge encourages adults to establish a physical activity "habit" that can be sustained throughout a lifetime. Various studies show that Walk Kansas is effective beyond the 8-week duration of the program. Participants identified through random selection that were assessed 6 months after the program did not demonstrate a significant decrease in moderate or vigorous activity between the program completion and 6-month follow-up. (The Society of Behavioral Medicine, 2008; Estabrooks, Bradshaw, Dzewaltowski, Smith-Ray.)

Results
Almost 19,000 individuals participated in the eight-week Walk Kansas program during 2010. Ninety-eight percent of the participants met the goal of 150 minutes of physical activity per week. Though only about 19% of Kansans consume the recommended amount of fruits and vegetables each day, 80% of Walk Kansas participants reported increasing fruit and vegetable consumption. Participants also reported they had increased energy (65%), better attitude (49%), improved sleep (41%), and decreased weight (41%).

4. Associated Knowledge Areas

KA Code	Knowledge Area
724	Healthy Lifestyle

Outcome #2

1. Outcome Measures

Number of substantial community projects that reflect shared participation in addressing community goals

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	700	1058

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Rural communities are struggling with lagging economies, loss of population, and declining engagement of citizens. The Kansas PRIDE program is an effort of Extension to engage citizens in community engagement through organized volunteer improvement efforts. These efforts recognize and support efforts that strengthen community agency and capacity building.

What has been done
The Kansas PRIDE (not an acronym) program supports and recognizes community volunteer groups organized for community betterment. The program is supported by the Kansas Department of Commerce, K-State Research and Extension, and Kansas PRIDE Inc. Bringing organizations together in communities is a key element of the success of PRIDE volunteer efforts. PRIDE reported working with 441 partner organizations to complete community improvement projects statewide.

Results
Through the involvement and support of Extension, community groups are organized and focused on community improvement efforts. In 2010, 80 communities participated in PRIDE program efforts. Each community developed projects that included focus areas of environmental improvements, health, human needs, and cultural events.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Number of volunteer hours of community members engaged in community improvement programs

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	70000	59745

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The philosophy of community development that Kansas PRIDE encourages is based on the fundamental valuing of volunteer citizen participation. PRIDE is a community development program, not an acronym.

What has been done
The implications of this community agency and capacity building are far reaching. It is immediately evident that PRIDE builds social networks, strengthens public voice, aids community collective decision-making, and provides a broader network of citizen access to community resources and power. Through this work, we observe that communication networks and levels of community trust and involvement are strengthened. These aspects of community dynamics prove themselves valuable for expediency of community action or reaction, expanded provision of community services, and a higher level of community readiness and resiliency to address community issues or crises events.

Results
At the most current Kansas appraisal of the dollar value of volunteerism by the Independent Sector, the 59,745 hours of volunteerism equates to an investment valued at just over $1,122,608. In addition to the volunteer hours generated, PRIDE communities reported raising $181,204 in public and private funds to re-invest in their local community improvement efforts.

4. Associated Knowledge Areas

KA Code	Knowledge Area
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families, and

	Communities
806	Youth Development

Outcome #4

1. Outcome Measures

Number of volunteers, faculty and staff who understand and demonstrate the use of youth development competencies, life skills development, and the essential elements of a positive learning environment.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	3000	3800

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
A 1998 national study by the Bayer Corporation focuses our attention to assuring young children discover that science is all around them and is fun! A positive attitude toward science and math prior to 4th grade results in higher elective enrollment in those subjects in middle and high school as well as better overall academic success.

What has been done
Making science relevant in the lives of young people is the single most important outcome we strive to achieve. Kansas is making use of the latest age appropriate non-formal STEM (science/technology/engineering/math) inquiry-based experiential learning curriculum. 4-H Science Ready has been introduced at four workshops to more than 80 extension educators and master 4-H volunteers across the state.

Results
Through partnerships with the National 4-H Council, McPherson and Shawnee counties have established Cargill 4-H Food Science Clubs for middle school students. Ninety-one percent of the pilot students reported having fun with learning and 54% are considering science-related education paths.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Number of youths who improve connectedness with parents, peers and other adults; improve their sense of social place/integration; improve attachments to prosocial/conventional institutions; express confidence in one's personal efficacy; demonstrate good emotional self regulation, coping, and conflict management skills.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	550	708

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Youths who are fully engaged in meaningful community improvement/ development projects report stronger ties to their communities and greater commitment their community's well-being and progress. The Get It Do It! program equips youth and adult partnerships to promote health in a manner tailored to small towns and their unique cultures. Through mini-grants, training, coaching, and participatory evaluation, local Get It Do It! teams comprised of PRIDE groups, young people and local Extension agents promote physical activity and healthy eating while strengthening youth engagement in small towns.

What has been done
Youth-adult partnerships in five communities successfully designed and implemented unique health promotion projects that: a) improved the physical activity settings (e.g., parks, trails), b) provided healthy eating and activity education, c) strengthened community social capital, and d) established opportunities for youth engagement and community belonging. Twenty-three percent of the total targeted populations across the five communities were served through these projects which generated $22,327.79 in local support (2745 volunteer hours and $2,300 local cash).

Results
At the end of project year, key informants in each community stated in anonymous post Axio surveys with--
100% agreement:
*Youth were involved and engaged in the project
*Adults recognized the involvement and engagement of youth volunteers
*Adults provided opportunities to improve the health and well-being of others in their community

80% agreement:
*Youth increased their leadership skills by participating in project
*Youth were involved and engaged in the project to improve the health and well-being of others in their community
*Adults provided meaningful opportunities for youth to be involved and engaged
*Adults provided opportunities for mentoring between youth and adults

A success story:
"It is positive when all ages come together to accomplish a project that was successful. The exercise stations are a wonderful addition to our City park. The goal to increase participation in physical activity of community members of all ages was accomplished." (S. M. of Grinnell)

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #6

1. Outcome Measures

Increased number of participants who have established financial goals to guide financial decisions toward financial security

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	5178

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many individuals and families are experiencing financial crisis because of inadequate savings, health care costs, too much debt, and poor planning for potential major life events. Saving--the ability to set aside some money routinely from a stream of income--is at the heart of household asset development. Extension targets programs for financially vulnerable populations. The overall goal is for people to acquire the knowledge, skills, and motivation to make behavior changes that will build financial security, which is the cornerstone of prosperous communities, nurturing neighborhoods, and strong families.

What has been done

Kansas places outreach focus on three primary financial programs: Kansas Saves; Medicare insurance decisions for prescription drug coverage; and financial decisions at Income tax sites for moderate to low-income clientele. The KSRE Financial Management program partners with the Kansas Department on Aging. More than 40 agents have received various levels of SHICK-Senior Health Insurance Counselors for Kansas training. Several KSRE local extension offices partner with a variety of IRS sponsored income tax sites in rural and urban areas, such as VITA-Volunteer Income Tax Assistance, and AARP. These sites target moderate to low-income Seniors, individuals and families. Approximately 5000 people were assisted directly at free income tax assistance sites and more than 10,000 were reached indirectly via KSRE media articles encouraging people to seek out free tax assistance sites in their locale.

Results

In early 2010, thirteen (13) agents who are fully Certified SHICK Counselors reported counseling 3105 Medicare beneficiaries in re-evaluating their Medicare Prescription Drug coverage. The new coverage choices resulted in $1.3 million saved for Kansas beneficiaries overall, or a savings of $343 per person who switched to a different Part D plan.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic Challenges

Brief Explanation

{No Data Entered}

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

Evaluation Results

Key Items of Evaluation

Program Focus Teams (PFTs) are working with staff from the Office of Educational Innovation and Evaluation (OEIE). Self-assessment questions have been shared for PFTs to review their Action Plans. OEIE staff have been contracted to strengthen teams' understanding of the evaluation process and to help teams develop evaluation tools. We believe our beginning investment in evaluation will strengthen ability in PFTs, and across our K-State Research and Extension system.