

2009 Kansas State University Combined Research and Extension Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

The motto of K-State Research and Extension is “Knowledge for Life.” This is a great motto for a land-grant university, such as Kansas State University. It means developing new knowledge and empowering people with that knowledge, whether they are our youth and 4-H clubs or our senior citizens. In order to accomplish this, K-State Research and Extension is focusing its efforts on Five Core Mission Themes: Healthy Communities: Youth, Adults, and Families; Safe Food and Human Nutrition; Natural Resources and Environmental Management; Competitive Agricultural Systems; and Economic Development through Value-Added Products. Additionally, K-State Research and Extension is developing areas of focused excellence. We cannot be everything to everyone; therefore, we have to focus on serving the highest priorities. Obviously, this also requires that we have the breadth to address other issues. Whether we develop the knowledge within K-State Research and Extension or work with another land-grant university or an industry partner to develop that knowledge, we must disseminate that knowledge on the K-State campus and the informal classrooms in all 105 counties across the state of Kansas. A unique feature within the K-State Research and Extension organization is the close alignment of research and extension. In 1996, K-State Research and Extension (KSRE) was formed by aligning the Kansas Agricultural Experiment Station and the Kansas Cooperative Extension Service. The strategic intent of this alignment was to achieve greater efficiency and synergy between discovery and outreach efforts. In preparation for a new planning cycle while awaiting guidelines from the Federal partner, KSRE began to develop a new Five-Year Work Plan. A steering committee engaged in internal and external discussions with stakeholders to select new core mission themes, long-term intended outcomes, and strategies that would result in their implementation. Each of our twelve long-term intended outcomes identifies a broad issue that is being addressed, the research foundation associated with it, and changes that will be measured over time. The steering committee was not charged with completing the in-depth planning that drives our day-to-day work. That effort involves a larger number of participants (i.e., agents, specialists, researchers, partners) within each of the intended outcomes. The core mission themes define areas of emphasis for agents, specialists, and researchers. The most visible modification in this new plan is an increased emphasis on adding value to agricultural products, although KSU has been engaged in value-added work for some time. We expect that economic growth will expand if new markets create greater demand for raw commodities. Estimating FTEs/SYs across federal, state, and county funding sources, there is no expected change. Although it was noted in the program prioritization process that specific areas may experience increase/decrease, these changes are not reflected in the totals for the broad programmatic areas. Planned programs are mostly state supported and through grant funds, also extensively reported through CRIS and the granting agencies.

Estimated Number of Professional FTEs/SYs total in the State.

Year	Extension		Research	
	1862	1890	1862	1890
2009	422.0	0.0	212.0	0.0
2010	422.0	0.0	212.0	0.0
2011	422.0	0.0	212.0	0.0
2012	422.0	0.0	212.0	0.0
2013	422.0	0.0	212.0	0.0

II. Merit Review Process

1. The Merit Review Process that will be Employed during the 5-Year POW Cycle

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

2. Brief Explanation

• Scientific peer review and merit review of all K-State Research and Extension Action Plan proposals will be accomplished by experts with scientific knowledge and technical skills to evaluate the quality and relevance to program goals. This includes projects funded by Hatch Multistate Research Funds, Hatch Funds, Smith-Lever, and state appropriated funds. The Associate Director of Research and/or the Associate Director of Extension select three peer reviewers on campus for specific proposals in consultation with department heads to identify reviewers with appropriate expertise. The plans are also reviewed by a panel of department heads, the associate directors of research and extension, assistant directors (Ag and Natural Resources, 4-H and Youth programs, Family and Consumer Sciences), as well as area directors. The agreement and acceptance within the team and the review by unit leaders and administrators, as well as peer reviewers assures that action plans adequately and appropriately address the issues. Several representative stakeholders will be invited to participate in the annual team meetings as well. • The review asks for an evaluation of the following points: overall appropriateness to K-State Research and Extension core mission themes and long-term intended outcomes; the investigators' grasp of the literature including a review of the most significant published work in the field; and a description of the current status of science in the area of the proposal. Also, do the objectives show a specific relationship to the improvement of Kansas agriculture and societal issues? Does the description of the project identify in non-technical language the methods or actions to be utilized in carrying out the proposed project? Do the methods relate to accomplishing each stated objective and are the methods stated clearly? A recommendation of approval or disapproval should be included in the review. A form is used to guide reviewers through the peer review process.

III. Evaluation of Multis & Joint Activities

1. How will the planned programs address the critical issues of strategic importance, including those identified by the stakeholders?

The planned programs were based on input from stakeholder groups who identified the most critical issues. Input from internal and external stakeholders has been used to guide our selection of core mission themes and long term intended outcomes. Faculty groups have interacted with external groups of agencies, organizations, and citizens to gain stakeholder feedback that has helped these efforts in terms of relevance, support, and understanding.

2. How will the planned programs address the needs of under-served and under-represented populations of the State(s)?

• The goal within K-State Research and Extension is to involve a representative cross-section of residents in all planning and outreach activities. There are, however, several specific programs that target under-served audiences for higher levels of involvement. These programs address needs of economically disadvantaged agricultural producers, youths, families, and communities and provide knowledge, skills, and practices where needs are great. Specific examples of work with under-served and under-represented groups:- Extension faculty and staff in counties surrounding Fort Riley are collaborating to develop strategies and marketing materials targeting military families. With an expectation of more than 30,000 people coming to the area, this is an opportunity to increase the reach of extension programs to nontraditional, underserved, and emerging audiences. It is essential they learn about basic military practices and procedures so that we might better serve and partner with this new audience.- Wyandotte County has seen a recent dramatic increase in Latino population going from 9% to 17% of the county's population in just five years. There is a Spanish-speaking population of around 30,000 residents that will benefit from the educational programs offered by establishing a Latino community outreach program through Wyandotte County Extension. A bilingual Family and Consumer Sciences Extension agent hired in 2004 will continue to develop excellent collaborations with human service agencies and other organizations that are reaching out to this community. - Expanded Food and Nutrition Education Program (EFNEP) and Family Nutrition Program (FNP) target low income and ethnically diverse populations. EFNEP will add one agent position in Wyandotte County as a result of increased funding.

3. How will the planned programs describe the expected outcomes and impacts?

Within our planned programs, we have identified twelve long-term intended outcomes: • Healthy Eating and Physical Activity • Healthy Sustainable Communities • Positive Child, Youth, and Family Development • Positive Adult Quality of Life • New and Enhanced Products from Agriculture • Conservation of Soil, Water, and Energy • Improved Quality of Land, Air, and Water • Efficient and Sustainable Cropping and Horticultural Systems • Efficient and Sustainable Animal Production Systems • Farm and Food Systems Management • Safe, Secure, High-quality Food Supply • Enhanced Nutritional Quality of the Food Supply Within

each of these long-term outcomes, short and intermediate term outcomes have also been identified. In addition, for each of the LTIOs, strategies and tactics were developed to describe and guide implementation of the LTIO--how it will be accomplished. As one example, a few of the tactics developed to support strategies in support of Conservation of Soil, Water, and Energy include: • Evaluate optimum cropping systems and dryland, no-till crop production systems using models and field trials. • Provide education and training in irrigation scheduling and new technologies for Certified Crop Advisors (CCAs). • Evaluate irrigation with animal waste effluent and subsurface drip irrigation. • Demonstrate Best Management Practices (BMPs) to avoid groundwater pollution from application of manure to cropland.

4. How will the planned programs result in improved program effectiveness and/or efficiency?

The planned programs provide focus on the most critical issues. In most programs, the results of extension education provide guidance to the research agenda and extension education is research-based. Extension activities with the public will identify areas of knowledge that lack research information. This void of research information is utilized by researchers to guide future investigations.

IV. Stakeholder Input

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

- Other (Survey of underserved, minority groups)
- Survey of traditional stakeholder groups
- Targeted invitation to selected individuals from general public

Brief explanation.

Input from internal and external stakeholders was used to guide our selection of core mission themes and long term intended outcomes (LTIOs). Throughout this process, we tried to build on the results of surveys that provided feedback about how KSRE was perceived by taxpayers. Input was received from direct contacts, meetings, a variety of discussions, and supplemented by a Web site designed to share information broadly and to provide another means for gathering feedback.

2(A). A brief statement of the process that will be 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
- Open Listening Sessions
- Use External Focus Groups

Brief explanation.

Stakeholder input will come through external advisory councils, elected officials, strategic planning, and program review processes. • At the local level, the Kansas Cooperative Extension Service law dictates election of local advisories and an executive board in each of our 105 counties. This amounts to publicly electing 2,520 individuals across the state. Of those, 945 are further elected to executive boards and are required by law to oversee the program, staff, and budget of our local Extension units across Kansas. • On a regional level, our research and extension centers make use of advisory committees composed of stakeholder leadership and clientele from the local area. During the year we also meet informally with a large number of diverse organizations to discuss collaborative efforts, consider sharing of resources, review prioritization process, assess progress reports and realized outcomes, and to design complementary educational efforts. Feedback examples include commodity commissions (e.g., deliberations that help prioritize the awarding of producer-funded extramural grants involving check-off dollars) and helping citizens to understand options associated with regulatory decisions made by the EPA, Kansas Department of Health and Environment, Kansas Department of Agriculture, and other groups.

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

1. Methods for collecting Stakeholder Input

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

Brief explanation

{NO DATA ENTERED}

3. A statement of how the input will be considered

- To Set Priorities
- Redirect Extension Programs
- In the Action Plans
- In the Budget Process
- Redirect Research Programs
- In the Staff Hiring Process
- To Identify Emerging Issues

Brief explanation.

The purpose of the strategic planning process was to identify key principles that must be given attention to assure the future to a relevant, sustainable, quality Extension Service in Kansas. 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. Of the 2520 publicly elected according to Kansas Extension law, 945 are further elected to executive boards and are required by law to oversee the program, staff, and budget of our local Extension units across Kansas.

V. Planned Program Table of Content

S. NO.	PROGRAM NAME
1	Healthy Communities: Youth, Adults and Families
2	Safe Food and Human Nutrition
3	Economic Development through Value-Added Products
4	Natural Resources and Environmental Management
5	Competitive Agricultural Systems

V(A). Planned Program (Summary)

Program #1

1. Name of the Planned Program

Healthy Communities: Youth, Adults and Families

2. Brief summary about Planned Program

• Through K-State Research and Extension’s multiple approaches – including basic and applied research and research-informed strategies – to promote healthy communities: youth, adults, and families, the public’s risk for chronic disease and mortality is decreased and quality of life for Kansans is increased. • Community policies and practices that are informed by research can make it easier for people to create healthy social, economic, and physical environments. K-State Research and Extension faculty apply research findings through continuing scholarship, program delivery, and consulting to build a community’s capacity for healthy and sustainable policies and practices. • K-State Research and Extension conceptualizes communities as place-based social systems. The extent to which communities are healthy and sustainable are interrelated. A community’s ability to meet its residents’ needs partly determines the health of its residents. The sustainability of a community, in turn, depends on the community’s ability, over time, to meet the needs of its residents. Attaining this outcome requires a systems approach. • K-State Research and Extension helps communities better themselves through economic development and leadership training. The work involves delivering educational programs and technical information that improves skills in communication, group dynamics, conflict resolution, issue analysis, strategic planning, effective parenting, developing life skills, consumer and financial management, and preparing youth to be responsible citizens. • Among both urban and rural consumers and other stakeholders, in large numbers, the people of Kansas seek out and benefit from K-State Research and Extension’s healthy lifestyle and physical activity theory- and evidence- based efforts, which emphasize basic and applied approaches to molecular biology, sensory analysis of foods, physical activity behaviors, and education and outreach. • Relationships with caring adults are essential for youths to achieve their potential because of the guidance, respect, skills, and knowledge and wisdom that adults can share. • Youth function effectively within their families, peer groups, school, and community. This implies youth have acquired citizenship, leadership, and positive life skills.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

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	15%		15%	
806	Youth Development	40%		10%	
903	Communication, Education, and Information Delivery	0%		30%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

• Kansans have not been immune to trends that affect children, youths, and families throughout the nation. • Among adults in Kansas, 57% are overweight or obese and only 22% report achieving recommended physical activity levels, according to 2001 Centers for Disease Control and Prevention’s (CDC) Behavioral Risk Factor Surveillance System data, at www.kdhe.state.ks.us/brfss. • K-State Research and Extension (KSRE), whose mission is grounded in “strong, healthy communities, families, and youth through integrated research, analysis, and education” seeks to understand and promote improved child, youth, and family development by focusing on the role of developmental settings (e.g., daycare, preschool, 4-H clubs, after-school programs, schools, faith settings, homes) and families in providing the best places to live, learn, play, and possibly raise children. KSRE’s work is directed toward helping families and settings to promote healthy and pro-social behavior, prevent the development of emotional and behavioral problems, and improve quality-of-life. • Currently there are 6,176 reported volunteers involved with delivery of 4-H youth development programs. To meet the needs of Kansas youth, an increased number of trained volunteers are essential to providing life skill development in positive learning environments. • Currently, 23,500 youth participate in a 4-H club experience, including community, project, afterschool, and military clubs. In addition, nearly 80,000 youth had some experience in a 4-H youth development program. • The focus of this program is healthy sustainable communities; positive child, youth, and family development; and positive adult quality of life.

2. Scope of the Program

- In-State Research
- In-State Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

• Today’s complex issues and problems require new perspectives and skills. • Community policies and practices that are informed by research can make it easier for people to create healthy social, economic, and physical environments.

2. Ultimate goal(s) of this Program

- Healthy, Sustainable Communities • Positive Child, Youth, and Family Development • Positive Adult Quality of Life

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2009	6.0	0.0	0.0	0.0
2010	6.0	0.0	0.0	0.0
2011	6.0	0.0	0.0	0.0
2012	6.0	0.0	0.0	0.0
2013	6.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- 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 technical assistance and educational programs to citizens seeking to make their communities healthy and sustainable places for meeting human needs.
- Establish links between community development researchers and practitioners for cooperative efforts that result in healthy, sustainable communities.
- 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.
- Provide imaginative, motivational, and experiential learning experiences to help youth build competencies and master life skills.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Workshop ● One-on-One Intervention ● Demonstrations ● Education Class ● Group Discussion 	<ul style="list-style-type: none"> ● Public Service Announcement ● Newsletters ● Web sites

3. Description of targeted 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(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2009	19000	0	12000	0
2010	20000	0	12500	0
2011	20000	0	12500	0
2012	21000	0	13000	0
2013	21000	0	13000	0

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

Expected Patent Applications

2009 :0 2010 :0 2011 :0 2012 :0 2013 :0

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	2	6	0
2010	2	6	0
2011	2	6	0
2012	2	6	0
2013	2	6	0

V(H). State Defined Outputs

1. Output Target

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

2009 :500 2010 :500 2011 :500 2012 :500 2013 :500

- Number of program participants

2009 :20000 2010 :20000 2011 :20000 2012 :20000 2013 :20000

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

2009 :40 2010 :50 2011 :70 2012 :70 2013 :70

V(I). State Defined Outcome

O. No	Outcome Name
1	Percentage of participants who participate in regular physical activity
2	Percentage of participants intending to increase their physical activity
3	Number of substantial community projects that reflect shared participation in addressing community goals
4	Number of volunteer hours of community members engaged in community improvement programs
5	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.
6	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.
7	Increased number of participants who have established financial goals to guide financial decisions toward
	financial security

Outcome #1

1. Outcome Target

Percentage of participants who participate in regular physical activity

2. Outcome Type : Change in Action Outcome Measure

2009 :10 2010 : 10 2011 : 10 2012 :10 2013 : 10

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

Outcome #2

1. Outcome Target

Percentage of participants intending to increase their physical activity

2. Outcome Type : Change in Knowledge Outcome Measure

2009 :20 2010 : 20 2011 : 20 2012 :20 2013 : 20

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle

Outcome #3

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

2009 :600 2010 : 700 2011 : 700 2012 :750 2013 : 750

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

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

Outcome #4

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

2009 :70000 2010 : 70000 2011 : 70000 2012 :70000 2013 : 70000

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families and Communities

- 806 - Youth Development

Outcome #5

1. Outcome Target

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. Outcome Type : Change in Action Outcome Measure

2009 :2000 2010 : 3000 2011 : 4000 2012 :4500 2013 : 4500

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 806 - Youth Development

Outcome #6

1. Outcome Target

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. Outcome Type : Change in Action Outcome Measure

2009 :750 2010 : 750 2011 : 900 2012 :900 2013 : 900

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 806 - Youth Development

Outcome #7

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

2009 :200 2010 : 200 2011 : 250 2012 :250 2013 : 300

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

{NO DATA ENTERED}

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

1. Evaluation Studies Planned

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

Description

{NO DATA ENTERED}

2. Data Collection Methods

- Observation
- Sampling

Description

{NO DATA ENTERED}

V(A). Planned Program (Summary)

Program #2

1. Name of the Planned Program

Safe Food and Human Nutrition

2. Brief summary about Planned Program

K-State Research and Extension (KSRE): • is a national leader in food-safety programs. K-State scientists and educators are focusing on developing and promoting a safe food supply from production to consumption. • has a rich history of working with pre-harvest (animal and plant production) and post-harvest (food microbiology and toxicology) issues that impact food safety. Many of the pre- and post-harvest food safety issues can impact human health, whereas others may impact our agricultural infrastructure, food supply, and economy. Food safety research, teaching, and extension efforts have put K-State Research and Extension in a strong position to address this new era of food security. • has developed multidisciplinary programs that are unique and essential to comprehensively address Food Safety and Security and go beyond the traditional agricultural, microbiological, veterinary, and food related sciences. For example, the areas of history and policy, crisis management, communication, and economics are all overarching disciplines that, when appropriately integrated, will make the K-State Research and Extension effort the most comprehensive in the U.S. and internationally. Faculty in these areas have programs addressing food safety and security issues. KSU is positioned with the vision and human and infrastructure resources to address the total spectrum of Food Safety and Security issues. • has programs that are contributing to improvements in health and nutrition behaviors, especially with low-income individuals who are at particular risk. • must continue its traditional role in researching known essential nutrients of foods in terms of roles they play in optimizing health, and their availability in foods, particularly those in Kansas commodities.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

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 Component	15%		15%	
703	Nutrition Education and Behavior	30%		20%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residue	15%		15%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Pa	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 (Situation and Scope)

1. Situation and priorities

• Kansans are concerned about their personal health and safety as well as that of their families and communities. • There are an estimated 76 million cases of food borne illness in the U.S. each year, resulting in about 325,000 hospitalizations and more than 5,000 deaths. In addition to the loss in human lives, there is a tremendous cost associated with treatment of people affected, time off work, and recall of contaminated food products. The number of food borne illnesses reported in Kansas may be an underestimate of the real number of cases, because the state does not have an active surveillance system, and food borne illnesses are greatly under reported. Recent concerns with potential “bio-terrorism” acts targeting the agricultural sector and the food supply have also created a need for addressing these issues. The state has a double challenge in the food safety area: first, to protect consumers from exposure to hazards that may find their way into the food supply at any stage of food production and consumption, and second, to maintain and improve the safety level of raw agricultural commodities such as beef, wheat, and soybeans which are at the heart of the economic well being of Kansas and of the national food security system. The challenge is to sustain educational, surveillance, and inspection systems for the hundreds of food and meat processing operations, and the thousands of food service institutions, and to initiate innovative programs for the detection, identification, and prevention of food safety hazards throughout the food system. • The link between diet and prevention of chronic diseases has long been known, however two trends are strengthening the role of medical nutrition therapy in health outcomes. First, the roles nutrients exert at biochemical, molecular and cellular levels are being redefined according to bioavailability and toxicology constructs. Second, bioactive compound foods that have not been historically classified as “nutrients,” have been found to promote optimal human health, especially in areas related to chronic disease. Many of these bioactive compounds have been routinely eliminated from foods through processing because of either objectionable sensory qualities or perceived inertness. Recent discoveries indicate that bioactive compounds have a powerful impact upon disease prevention with many even more powerful than prescribed drugs.

2. Scope of the Program

- Integrated Research and Extension
- Multistate Integrated Research and Extension
- Multistate Extension
- In-State Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

• New emerging issues and pathogens derailing set programs • Lack of resources: financial and personnel • Ability to respond to emergencies

2. Ultimate goal(s) of this Program

• Safe, pathogen-free food supply • Healthier people • Decreased cost of health care due to incidence of foodborne illness and chronic disease • All Kansans have enough food to eat

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2009	3.0	0.0	0.0	0.0
2010	3.0	0.0	0.0	0.0
2011	3.0	0.0	0.0	0.0
2012	3.0	0.0	0.0	0.0
2013	3.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

• 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. • Increase understanding of the role of food and its components in improving human health and reducing the risk of nutrition related disorders. • Develop technology to reduce the hazards and improve the quality of animal food products, which will complement the development of HACCP programs by USDA. • Design systems to preserve, prepare, and store foods and agricultural products to enhance nutrients and bioactive compounds and educate consumers about these systems. • 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. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Workshop ● Education Class ● Group Discussion ● Demonstrations ● One-on-One Intervention 	<ul style="list-style-type: none"> ● Other 2 (white papers; OpEd articles) ● Other 1 (professional & trade journals) ● Web sites ● Newsletters

3. Description of targeted 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 educators • 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 • Consumer groups (i.e., STOP)

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2009	500	0	500	0
2010	500	0	500	0
2011	500	0	500	0
2012	500	0	500	0
2013	500	0	500	0

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

Expected Patent Applications

2009 :0 2010 :0 2011 :0 2012 :1 2013 :1

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	20	2	0
2010	20	2	0
2011	20	2	0
2012	20	2	0
2013	20	2	0

V(H). State Defined Outputs

1. Output Target

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

2009 :2	2010 :2	2011 :3	2012 :3	2013 :3
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- Number of therapeutic, chemical, and physical treatments developed for animals and plants and their products to eliminate or reduce contamination with potential hazards

2009 :2	2010 :2	2011 :3	2012 :3	2013 :3
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- Number of extension and research seminars, workshops, and other educational programs presented using a variety of media options and communication tools

2009 :100	2010 :100	2011 :100	2012 :100	2013 :100
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- Number of attendees at educational programs (previous item) whether growers, processors, commercial and non-commercial food service personnel, market and home gardeners, retail markets, and consumers (including limited resource individuals, minorities, and other at risk populations)

2009 :1000	2010 :1000	2011 :1000	2012 :1000	2013 :1000
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V(I). State Defined Outcome

O. No	Outcome Name
1	Percentage of individuals and families who have reduced anxiety related to food security
2	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
3	Number of participants passing food service employees food handler certification
4	Number of individuals and families who have adopted best management practices for food handling and agricultural biosecurity
5	Number of participants passing food service manager/supervisor food handler certification

Outcome #1

1. Outcome Target

Percentage of individuals and families who have reduced anxiety related to food security

2. Outcome Type : Change in Condition Outcome Measure

2009 :3 2010 : 3 2011 : 5 2012 :5 2013 : 5

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occuring Toxins

Outcome #2

1. Outcome Target

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. Outcome Type : Change in Knowledge Outcome Measure

2009 :1000 2010 : 1000 2011 : 1000 2012 :1000 2013 : 1000

3. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

4. Associated Knowledge Area(s)

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

Outcome #3

1. Outcome Target

Number of participants passing food service employees food handler certification

2. Outcome Type : Change in Action Outcome Measure

2009 :300 2010 : 300 2011 : 400 2012 :400 2013 : 450

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

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

Outcome #4

1. Outcome Target

Number of individuals and families who have adopted best management practices for food handling and agricultural biosecurity

2. Outcome Type : Change in Action Outcome Measure

2009 :200 2010 : 300 2011 : 400 2012 :500 2013 : 500

3. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

4. Associated Knowledge Area(s)

- 711 - Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources.
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occuring Toxins

Outcome #5

1. Outcome Target

Number of participants passing food service manager/supervisor food handler certification

2. Outcome Type : Change in Action Outcome Measure

2009 :200 **2010** : 250 **2011** : 250 **2012** :300 **2013** : 300

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

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

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

From past experience, any or all of these factors can impact outcomes of this planned program.

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

1. Evaluation Studies Planned

- Comparisons between program participants (individuals,group,organizations) and non-participants
- Before-After (before and after program)
- Retrospective (post program)
- Other (see below)
- During (during program)

Description

• Initiatives funded by other sources (i.e., industry) • Clientele that utilize programs (i.e., number of students taking food science/safety courses)

2. Data Collection Methods

- Mail
- Structured
- Observation
- Tests
- Other (see below)
- Unstructured
- Sampling
- On-Site

Description

- Enrollment in programs and student feedback/evaluations

V(A). Planned Program (Summary)

Program #3

1. Name of the Planned Program

Economic Development through Value-Added Products

2. Brief summary about Planned Program

K-State Research and Extension projects have studied US and export food markets and evaluated the benefit of improving the quality and marketability of Kansas' agricultural grain and meat products. Research in food processing and marketing is necessary to determine which value-added products or processes are economically sustainable in Kansas. Educational programs are essential to teach Kansans about the advantage of value-added opportunities. The Kansas Ag Innovation Center has the mandate to work closely with producer-entrepreneurs in their search for and execution of innovative solutions. This mandate is important and critical to the long-run sustainability of agricultural producers and the viability of rural communities. The Center is focusing on helping producer-entrepreneurs innovate their processes, products, and relationships with the view to extending the value producer-entrepreneurs extract from the marketplace. Thus, we are focusing on innovation activities that increase the producer-entrepreneurs' wealth creation potential. • K-State Research and Extension faculty has expertise in many disciplines that can be applied to the urgent need to find alternative approaches to fuels and consumer products for which we currently rely on petroleum and other fossil fuels. We have expertise in logistics for accessing biomaterials, for biochemistry to convert our agricultural feedstocks to simple building block compounds, and then convert these compounds into a range of chemicals, adhesives, polymers, and biofuels. K-State engineering faculty has expertise in process design and our economists are expert in market development and application of our rural resources to meet market needs. • The most visible modification in this new plan is an increased emphasis on adding value to agricultural products, although KSU has been engaged in value-added work for some time. We expect that economic growth will expand if new markets create greater demand for raw commodities.

3. Program existence : Intermediate (One to five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	40%		40%	
502	New and Improved Food Products	0%		20%	
511	New and Improved Non-Food Products and Processes	40%		20%	
601	Economics of Agricultural Production and Farm Management	0%		10%	
603	Market Economics	20%		10%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

The Agriculture Committee of Governor Graves' 21st Century Vision Task Force declared that adding value to Kansas' agricultural commodities would be the centerpiece of maintaining agricultural prosperity in Kansas, in the near future. The faculty engaged in agricultural value-added science, education, and outreach is dispersed across campus in three colleges and eleven departments. Much of the value-added science relates to food products. Some of the value-added work is in the development of non-food, industrial products from agricultural commodities. This is a growing area of focus. The new Bioprocessing and Industrial Value Added Program (BIVAP) facility will provide a facility for research and incubation of novel product industry. • The industrial value-added product group develops and improves technologies that utilize agricultural raw materials available in Kansas to produce higher value products. The fiber and textile program focuses on the development of industrial value added materials and products made from natural and manufactured fibers that are essential to human health, safety and comfort, and contribute to local and national economies. Projects encompass developing biobased adhesives and composites, biodegradable plastics, optimizing soy cultivars for protein adhesive applications, characterizing and improving fiberboard products to improve integrity, appearance, moisture and insect resistance, optimizing fermentation parameters to improve cellulosic material conversion to sugars, and development of biorefinery model systems to improve conversion efficiencies. The BIVAP facility opened in April 2004, provides potential for rapid growth in this area of study. • While the utilization of ethanol and other bio-based fuels have been recognized for decades, inexpensive petroleum resources have made it uneconomic to exploit our renewable resources from agriculture. The recent increase in petroleum price has heightened awareness of the importance of relearning the conversion processes that transform biomaterials into fuels, as well as other products that we have derived from petroleum. • This is a unique opportunity for agriculture to provide solutions that help provide independence from foreign energy suppliers, invigorate our rural economy, and improve national security. However, additional research is needed to improve the efficiencies for bioconversion. Once improved technologies are established, we can provide ongoing technical outreach to assure that the newest developments are applied in this rapidly advancing industry.

2. Scope of the Program

- Integrated Research and Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

• Finite petroleum resources, at some point in the future, must be replaced by bio-based resources for production of many of our product and energy needs. This transition will require time and infrastructure changes along with new technology development. Development of sound science to support this transition is critical to long-term stability of our society. • Funding resources must grow if this new area is to fulfill the needs we have to better utilize our agricultural resources and reduce reliance on petroleum resources. • The key area of research in near future is learning how to better utilize the cellulosic components of our biobased resources. As ethanol demand increases, agriculture will not be able to meet this need with starch alone. The more abundant cellulosic carbohydrate materials will need to be utilized. This will require new technology development as well as effective transfer to users in the industry.

2. Ultimate goal(s) of this Program

Economic Development through Value-Added Products

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2009	0.8	0.0	0.0	0.0
2010	0.8	0.0	0.0	0.0
2011	0.8	0.0	0.0	0.0
2012	0.8	0.0	0.0	0.0
2013	0.8	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

• Increase awareness of value of biobased products in the commercial marketplace. • Develop new processes to modify agricultural-based materials into higher value products. • Enhance utilization of co-products from processing of agricultural materials in various applications. • Assess constraints and value opportunities for Kansas agricultural goods. • Emphasize conversion of cellulosic materials to ethanol.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● Other 2 (Proprietary tech dev & licensing) ● Workshop ● Other 1 (Joint projects) 	<ul style="list-style-type: none"> ● Newsletters ● Other 2 (Peer reviewed journal articles) ● Other 1 (Press releases; radio interviews) ● Web sites

3. Description of targeted audience

• 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(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2009	300	0	120	0
2010	300	0	130	0
2011	300	0	145	0
2012	300	0	160	0
2013	300	0	160	0

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

Expected Patent Applications

2009 :2 2010 :2 2011 :2 2012 :2 2013 :2

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	5	0	0
2010	5	0	0
2011	5	0	0
2012	5	0	0
2013	5	0	0

V(H). State Defined Outputs

1. Output Target

- Number of presentations at national and international conferences

2009 :20 2010 :20 2011 :20 2012 :25 2013 :25

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of new processes to improve utilization of biological raw materials as bioconversion substrates
2	Percent growth in income and employment attributed to bio-based agriculture and food related businesses.
3	Number of new bio-based businesses created.
4	Percent growth in existing value-added business entities.

Outcome #1

1. Outcome Target

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

2. Outcome Type : Change in Knowledge Outcome Measure

2009 :2 2010 : 2 2011 : 2 2012 :3 2013 : 3

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 511 - New and Improved Non-Food Products and Processes

Outcome #2

1. Outcome Target

Percent growth in income and employment attributed to bio-based agriculture and food related businesses.

2. Outcome Type : Change in Condition Outcome Measure

2009 :5 2010 : 5 2011 : 5 2012 :5 2013 : 0

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 511 - New and Improved Non-Food Products and Processes

Outcome #3

1. Outcome Target

Number of new bio-based businesses created.

2. Outcome Type : Change in Action Outcome Measure

2009 :1 2010 : 1 2011 : 1 2012 :1 2013 : 0

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 511 - New and Improved Non-Food Products and Processes
- 603 - Market Economics

Outcome #4

1. Outcome Target

Percent growth in existing value-added business entities.

2. Outcome Type : Change in Action Outcome Measure

2009 :5 2010 : 5 2011 : 5 2012 :5 2013 : 5

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 501 - New and Improved Food Processing Technologies
- 511 - New and Improved Non-Food Products and Processes
- 603 - Market Economics

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

This area will be quite volatile with policy changes and incentive programs affecting economics of target processes. It will be challenging to stay focused on the fundamental scientific issues that will serve as platforms to solve problems independent of policy changes.

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

1. Evaluation Studies Planned

- 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
- During (during program)
- Before-After (before and after program)
- Case Study

Description

• We do not anticipate the program being completed soon, so the program will be shifting to meet new technical needs within the same field. Evaluations will be primarily during program. • There should be several case studies that will be instructive as communication tools.

2. Data Collection Methods

- On-Site

Description

• Data collection will be mostly on-site as new plants are built, rural economies expand, and new licenses are applied. • Other metrics will be extramural funding, industry partners, patents, licenses, publications, presentations at national/international meetings.

V(A). Planned Program (Summary)

Program #4

1. Name of the Planned Program

Natural Resources and Environmental Management

2. Brief summary about Planned Program

Concern about the quality of the environment continues to guide K-State Research and Extension to develop programs that ensure quality and conservation of surface water and groundwater, promote community residential environmental management, develop systems for improved soil and air quality, and maintain plant diversity. Changing environmental regulations are also creating planned programs to inform our audiences about best management practices to meet the new regulations.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

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 (Situation and Scope)

1. Situation and priorities

• Soil, water, and energy conservation is crucial to sustain the viability of the agricultural economy in Kansas. In western Kansas, the Ogallala Aquifer supports irrigated crop agriculture that provides feed grains for a robust animal feeding industry, as well as providing water for municipal and industrial uses. The aquifer is a finite resource with recharge rates of near zero or so small as to be dwarfed by withdrawal rates. Large areas of Kansas have only a 20-50 years supply at current extraction rates. Water use and availability, the economics of water extraction and crop production, technology development and adoption, and current and new policies will determine the viability of agriculture in Kansas and the useable life of the aquifer. These issues will shape the rural landscape and socioeconomic condition of much of Kansas in the decades to come. • For areas of rainfed crop production,

especially in central and eastern Kansas, strategies for more efficient capture and use of water and for protection of soil against erosion are critical. There is also an opportunity to better manage soils for carbon sequestration and not only sustain productivity but mitigate increasing ambient concentrations of carbon dioxide. • Agricultural production of biomass is a promising source of renewable energy derived from direct burning for electricity generation and processing into chemical feedstocks and fuels. Use of biofuels will enhance national energy security and promote sustainability of rural economies and social structure. Even though Kansas has a strong production agriculture base that could produce biofuels on a large scale, there will be a need to balance their production with existing agricultural and urban demands on our land and water resources. Developing a conservation approach to agricultural production of biofuels could help meet water quality and conservation goals, protect farmlands, improve biodiversity and wildlife habitat, enhance rural economic opportunities, and simultaneously contribute to national renewable energy goals. • Abundant clean water is crucial to the Kansas economy. Much of Kansas depends on surface water in streams or reservoirs that provide drinking water sources, municipal and other domestic and industrial uses, recreation, livestock watering, and other agricultural uses to vast areas of Kansas. The state has several designated high priority Total Maximum Daily Loads (TMDLs) streams and watersheds where water quality restoration actions are needed. Many of the streams are impaired for fecal coliform bacteria and dissolved oxygen (an indicator of sediment, nutrient, and organic matter loading), while many reservoirs are impaired for eutrophication. Common sources of fecal bacteria include livestock in and/or near streams, human contributions from municipal sewage systems or from individual on-site waste systems, and sometimes wildlife. Common sources of nutrient, sediment, and organic loading are from confined livestock, non-confined livestock, and cropland. Watershed remediations with leadership and engagement by local stakeholders are needed to address many of the water quality problems in Kansas. • Almost half (42%) of the nation's fed beef supply is produced and processed on the High Plains of Texas and southwestern Kansas, with projections of continued growth not only in fed beef cattle, but also large scale dairies and swine production, which are relocating to the region. The animal feeding industry represents a major economy of the High Plains. Air quality issues are presenting major challenges for confined animal feeding, as dust and odor-related complaints by the public become more frequent. Animal agriculture is a major source of ammonia, which when combined with other gaseous pollutants, can form respirable particulate matter and contribute to regional haze problems; Kansas is among the seven states that have the highest ammonia emissions in the U.S., according to the United States Environmental Protection Agency (USEPA). Best Management Practices (BMPs) for minimizing emissions need to be developed, tested, and delivered to producers.

2. Scope of the Program

- Multistate Research
- Integrated Research and Extension
- Multistate Extension
- Multistate Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)

1. Assumptions made for the Program

There is effort underway to re-evaluate water use policy, make adjustments, and provide incentives for water conservation and wise use that will prolong the life of the Ogallala Aquifer. However, these actions need to be coupled with and built upon a sound scientific information base.

2. Ultimate goal(s) of this Program

- Conservation of Soil, Water, and Energy
- Improved Quality of Land, Air, and Water

V(E). Planned Program (Inputs)

1. Estimated Number of professional FTE/SYs to be budgeted for this Program

Year	Extension		Research	
	1862	1890	1862	1890
2009	3.0	0.0	0.0	0.0
2010	3.0	0.0	0.0	0.0
2011	3.0	0.0	0.0	0.0
2012	3.0	0.0	0.0	0.0
2013	3.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

- Review existing and ongoing research to evaluate utilization of precipitation and extent of protective land cover for semi-arid crop systems which differ in cropping intensity, (i.e., number of crops harvested in a rotation cycle).
- Emphasize the importance of integration of water and nutrient management to agricultural producers.
- Develop a decision model and improved management practices for limited irrigation.
- Evaluate improved management and disseminate information for improving water conservation in urban and suburban settings.
- Provide education and training in irrigation scheduling and new technologies for Certified Crop Advisors (CCAs).
- Use the Mobile Irrigation Lab to educate irrigators about water conservation and management and demonstrate improved technologies.
- Evaluate optimum cropping systems and dryland, no-till crop production systems using models and field trials.
- Demonstrate Best Management Practices (BMPs) to avoid groundwater pollution from application of manure to cropland.
- Conduct an educational program and public awareness campaign aimed at citizen action to meet TMDLs, especially abatement of fecal coliform bacteria.
- Provide educational and technical assistance for improved waste management to livestock producers.
- Evaluate BMPs for reducing phosphorus, sediment, and pesticides in surface runoff from cropland and grazing lands.
- Evaluate the benefits and design of riparian buffers and other kinds of vegetated filter strips for Kansas.
- Conduct water quality assessments for watersheds that drain into important public water supply reservoirs in Kansas.
- Protect existing riparian forest lands and implement BMPs to improve health and productivity to reduce non-point source pollutants in surface waters.
- Provide education and assistance in urban water quality restoration and protection planning for local governments.
- Validate and implement a Phosphorus Site Index in Kansas.
- Achieve a better understanding of nitrogen build up in soils where manure is applied and consequences of nitrogen buildup through research and experience with nutrient management planning. Identify trade-offs between N-based and P-based manure application.
- Provide education and training in water quality planning and management to local government entities.
- Evaluate "green technologies" for treating and managing storm water runoff in an urban setting (Topeka).
- Identify sources of fecal bacteria using bacteria source tracking in the Wichita area.
- Provide environmental education to youths through the EARTH program.
- Evaluate best management practices for the ability to sequester carbon and improve soil quality.
- Develop educational materials and Web sites for producers, the agricultural and energy industry, and policy makers on issues related to implementing a soil carbon sequestration program.
- Develop a scientific basis for policies that would enhance agricultural practices that enhance soil carbon sequestration and provide incentive for producers.
- Review, evaluate, and analyze existing information on crop production for biomass energy with the goal of synthesizing relationships between productivity, land class, water availability, and economic potential. From these relationships, build a decision support model that will evaluate cropping strategies for biomass energy production that enhance farm financial performance and minimize adverse environmental impacts.
- Develop educational materials and programs aimed at increasing the capacity to produce biomass for energy in Kansas.
- Deliver education and technology transfer programs that address characterization and cost-effective abatement of airborne emissions from open lot feeding systems.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● One-on-One Intervention ● Other 2 (Fair and conference displays) ● Demonstrations ● Workshop ● Other 1 (Tours) ● Education Class 	<ul style="list-style-type: none"> ● Web sites ● Other 1 (Web-based educational materials) ● Newsletters ● Other 2 (Magazine and newspaper articles)

3. Description of targeted audience

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

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2009	5000	0	1000	0
2010	5000	0	1000	0
2011	5000	0	1000	0
2012	5000	0	1000	0
2013	0	0	0	0

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

Expected Patent Applications

2009 :0 2010 :0 2011 :0 2012 :0 2013 :0

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	12	16	0
2010	12	16	0
2011	12	16	0
2012	12	16	0
2013	12	16	0

V(H). State Defined Outputs

1. Output Target

- Number of educational programs delivered

2009 :25 2010 :25 2011 : 30 2012 :30 2013 :30

- Number participating in educational programs

2009 :600 2010 :600 2011 : 800 2012 :800 2013 :800

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of producers adopting BMPs that protect environmental quality
2	Number of acres utilizing wastewater applications for crop production
3	Number of irrigators using evapotranspiration (ET)-based irrigation scheduling

Outcome #1

1. Outcome Target

Number of producers adopting BMPs that protect environmental quality

2. Outcome Type : Change in Action Outcome Measure

2009 :100 2010 : 100 2011 : 100 2012 :100 2013 : 100

3. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

4. Associated Knowledge Area(s)

- 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 Target

Number of acres utilizing wastewater applications for crop production

2. Outcome Type : Change in Condition Outcome Measure

2009 :25000 2010 : 25000 2011 : 30000 2012 :30000 2013 : 30000

3. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

4. Associated Knowledge Area(s)

- 111 - Conservation and Efficient Use of Water

Outcome #3

1. Outcome Target

Number of irrigators using evapotranspiration (ET)-based irrigation scheduling

2. Outcome Type : Change in Action Outcome Measure

2009 :500 2010 : 500 2011 : 500 2012 :500 2013 : 500

3. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

4. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 111 - Conservation and Efficient Use of Water

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

From past experience, any or all of these factors can significantly impact outcomes of this planned program.

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

1. Evaluation Studies Planned

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

Description

A combination of the planned studies will provide the most useful and comprehensive results.

2. Data Collection Methods

- Sampling
- Observation

Description

Selected methods are self-explanatory.

V(A). Planned Program (Summary)

Program #5

1. Name of the Planned Program

Competitive Agricultural Systems

2. Brief summary about Planned Program

K-State Research and Extension responds to immediate and future problems that affect agriculture, families, and communities. KSRE is developing improved, efficient, and profitable crop and livestock production systems while protecting the environment. Agricultural technologies, risk-management strategies, and information systems are best management practices that agricultural producers use to produce profitable, safe, and appealing food and fiber products. Agriculture and agribusiness contribute to the total economy of Kansas, both directly and indirectly. One in five Kansans, rural and urban, work in jobs related to agriculture and food production. Kansas has a strong agricultural tradition that predates its statehood, and it continues to be a significant contributor to the state's economic well-being. To address K-State Research and Extension's mission of achieving "... a safe, sustainable, competitive food and fiber system and ... strong, healthy communities, families and youth ..." will require significant, continued research and extension efforts devoted to improving the efficiency, profitability, and sustainability of crop, horticulture, and livestock operations in Kansas.

3. Program existence : Mature (More than five years)

4. Program duration : Long-Term (More than five years)

5. Expending formula funds or state-matching funds : Yes

6. Expending other than formula funds or state-matching funds : No

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	30%		15%	
216	Integrated Pest Management Systems	5%		10%	
307	Animal Management Systems	40%		20%	
311	Animal Diseases	0%		25%	
601	Economics of Agricultural Production and Farm Management	20%		15%	
606	International Trade and Development	0%		5%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)

1. Situation and priorities

• Agriculture plays a very significant role in the Kansas economy. Of the total cash receipts from agriculture in recent years, approximately two-thirds of those receipts were derived from livestock and their associated products. Kansas is a leader in beef production, with more than 22% of all US beef originating from Kansas beef processing facilities. The state ranks second in cattle and calves on farms and in cattle and calves on grain feed, ninth in hogs on farms, 10th in market sheep and lambs, 18th in milk produced and in sheep and lambs on farms, and 19th in meat and other goats. Kansas has one of the fastest growing dairy industries in the nation (60% production increase since 1998) with new annual product sales that exceed \$80 million. Producing 450,000,000 pounds of pork, (1.65 million head), Kansas ranks 9th in state swine production with 310 operations producing 95% of the state's pork. • Kansas farmers produce approximately 22 million acres of wheat, corn, grain sorghum, soybeans, sunflowers, and alfalfa each year, generating about \$3 billion of revenue. Flour milling and livestock production have traditionally multiplied the value of crops produced. Recent construction of fuel ethanol plants in many communities has also added to that multiplier. However, the harsh and diverse climate that characterizes Kansas makes production of grain crops challenging and results in highly variable yields from year to year. • Kansas also has a diverse and growing horticultural industry composed of turf grasses (golf courses, lawns, and roadways), floral crops, ornamentals, nursery businesses and fruit, nut, and vegetable production. The value of all horticultural products in the state continues to increase and presently approaches \$1 billion annually.

2. Scope of the Program

- Multistate Integrated Research and Extension
- Multistate Extension
- Multistate Research
- In-State Research
- In-State Extension
- Integrated Research and Extension

V(D). Planned Program (Assumptions and Goals)**1. Assumptions made for the Program**

Agricultural producers and agribusiness managers face a rapidly changing decision-making environment resulting from a combination of forces, including agricultural policy changes, globalization, technological change, and structural change across all sectors of the food and fiber industry. The increased complexity of the management environment makes it more difficult for clientele to understand the interrelationships between the decisions they make and the range of resulting outcomes.

2. Ultimate goal(s) of this Program

- Efficient and Sustainable Cropping and Horticultural Systems
- Efficient and Sustainable Animal Production Systems
- Improved Management of Viable Farm and Food Systems

V(E). Planned Program (Inputs)**1. Estimated Number of professional FTE/SYs to be budgeted for this Program**

Year	Extension		Research	
	1862	1890	1862	1890
2009	14.0	0.0	2.2	0.0
2010	14.0	0.0	2.2	0.0
2011	14.0	0.0	2.2	0.0
2012	14.0	0.0	2.2	0.0
2013	14.0	0.0	2.2	0.0

V(F). Planned Program (Activity)**1. Activity for the Program**

- Evaluate and develop technologies and production strategies that will enhance production efficiencies and industry profitability.
- 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.
- Assist producers in improving the economic efficiency of crop and livestock production enterprises and the marketing of products through research and educational programs.
- 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.
- Provide educational programs that assist farm managers in addressing key and emerging issues in the agricultural production sector.
- 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 one-on-one financial, economic and farm business planning and management assistance through the Kansas Farm Management Association program.
- 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.
- Develop case studies on cooperatives and value-added ventures.

2. Type(s) of methods to be used to reach direct and indirect contacts

Extension	
Direct Methods	Indirect Methods
<ul style="list-style-type: none"> ● One-on-One Intervention ● Other 1 (Field Days, Tours) ● Demonstrations ● Workshop ● Education Class 	<ul style="list-style-type: none"> ● Other 1 (Extension publications) ● Other 2 (Research publications) ● TV Media Programs ● Web sites ● Billboards ● Newsletters

3. Description of targeted audience

• Farm and ranch managers • Agricultural producers and agribusinesses throughout the food industry supply chain • Farm input suppliers, lenders, Extension educators, and policy makers

V(G). Planned Program (Outputs)

1. Standard output measures

Target for the number of persons(contacts) to be reached through direct and indirect contact methods

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
2009	10000	0	1000	0
2010	10000	0	1000	0
2011	10000	0	1000	0
2012	10000	0	1000	0
2013	10000	0	1000	0

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

Expected Patent Applications

2009 :3 2010 :3 2011 :3 2012 :3 2013 :3

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	25	15	0
2010	25	15	0
2011	25	15	0
2012	25	15	0
2013	25	15	0

V(H). State Defined Outputs

1. Output Target

- Number of individuals participating in programs

2009 :10000 **2010** :10000 **2011** : 10000 **2012** :10000 **2013** :10000

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

2009 :3 **2010** :3 **2011** : 3 **2012** :3 **2013** :3

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

2009 :650 **2010** :650 **2011** : 650 **2012** :650 **2013** :700

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

2009 :3000 **2010** :3000 **2011** : 3000 **2012** :3000 **2013** :3000

V(I). State Defined Outcome

O. No	Outcome Name
1	Number of livestock producers who demonstrate best management practices (BMPs) 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 producers who adopted BMPs
5	Number of crop acres using soil testing as a basis for nutrient applications
6	Percent of producers demonstrating improvement of Kansas ground and surface water with respect to nutrient loads
7	Number of soil samples evaluated on Kansas crop acreage
8	Changes in average or typical observed cropping systems, rotations, and crops
9	Hours and activities reported annually by Master Gardener volunteers

Outcome #1

1. Outcome Target

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

2. Outcome Type : Change in Condition Outcome Measure

2009 :750 **2010 :** 750 **2011 :** 800 **2012 :**800 **2013 :** 800

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 307 - Animal Management Systems
- 601 - Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Target

Number of Kansas farms and ranches increasing awareness of financial performance

2. Outcome Type : Change in Condition Outcome Measure

2009 :3000 **2010 :** 3000 **2011 :** 3000 **2012 :**3000 **2013 :** 3000

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 601 - Economics of Agricultural Production and Farm Management

Outcome #3

1. Outcome Target

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

2. Outcome Type : Change in Condition Outcome Measure

2009 :7500000 **2010 :** 7500000 **2011 :** 7500000 **2012 :**7500000 **2013 :** 7500000

3. Associated Institute Type(s)

- 1862 Research

4. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms

Outcome #4

1. Outcome Target

Number of crop producers who adopted BMPs

2. Outcome Type : Change in Action Outcome Measure

2009 :750 **2010 :** 750 **2011 :** 800 **2012 :**800 **2013 :** 800

3. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 216 - Integrated Pest Management Systems
- 601 - Economics of Agricultural Production and Farm Management

Outcome #5

1. Outcome Target

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

2. Outcome Type : Change in Condition Outcome Measure

2009 :350000 **2010 :** 350000 **2011 :** 400000 **2012 :**400000 **2013 :** 400000

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems

Outcome #6

1. Outcome Target

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

2. Outcome Type : Change in Condition Outcome Measure

2009 :5 **2010 :** 5 **2011 :** 5 **2012 :**5 **2013 :** 5

3. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems

Outcome #7

1. Outcome Target

Number of soil samples evaluated on Kansas crop acreage

2. Outcome Type : Change in Action Outcome Measure

2009 :70000 **2010 :** 70000 **2011 :** 70000 **2012 :**70000 **2013 :** 70000

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 601 - Economics of Agricultural Production and Farm Management

Outcome #8

1. Outcome Target

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

2. Outcome Type : Change in Action Outcome Measure

2009 :5 **2010 : 5** **2011 : 5** **2012 :5** **2013 : 5**

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 601 - Economics of Agricultural Production and Farm Management

Outcome #9

1. Outcome Target

Hours and activities reported annually by Master Gardener volunteers

2. Outcome Type : Change in Knowledge Outcome Measure

2009 :75000 **2010 : 75000** **2011 : 75000** **2012 :80000** **2013 : 80000**

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

From past experience, any or all of these factors can significantly impact outcomes of this planned program.

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

1. Evaluation Studies Planned

- Before-After (before and after program)
- Retrospective (post program)
- During (during program)
- Comparisons between program participants (individuals,group,organizations) and non-participants

Description

A combination of the planned studies will provide the most useful and comprehensive results.

2. Data Collection Methods

- Observation
- On-Site
- Sampling

Description

Selected methods are self-explanatory.