

2009 University of Illinois Combined Research and Extension Plan of Work

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I. Plan Overview

1. Brief Summary about Plan Of Work

The College of Agricultural, Consumer and Environmental Sciences

ACES: Real Science, Real Solutions, Real People. The mission of the College of Agricultural, Consumer and Environmental Sciences is discovering, advancing, and integrating new knowledge to ensure nutritious and safe food, sustainable and innovative agriculture, strong families and communities, and environmentally sound natural resource management to benefit the people of Illinois and the world. The land-grant mission requires capacity and active programs in areas of research, education and public engagement that are specifically relevant to needs in the Illinois food, agricultural, and more recently, energy systems. To fulfill the University's land-grant mission, ACES is responsible for the Illinois Agricultural Experiment Station and University of Illinois Extension, subsidiary units authorized by federal and state statutes that complement the academic departments.

The seven academic departments include: Agricultural and Biological Engineering, Agricultural and Consumer Economics, Animal Sciences, Crop Sciences, Food Science and Human Nutrition, Human and Community Development, and Natural Resources and Environmental Sciences. ACES also provides intellectual and administrative leadership to the Division of Nutritional Sciences. Illinois is among an elite group of institutions noted for the impact of research in food and agricultural sciences. Among the programs cited by The Chronicle of Higher Education in its ranking of "Top Research Universities in the 2005 Faculty Scholarly Productivity Index," the University of Illinois ranked second in animal science and food science and third in crop science. U.S. News and World Report ranked the Department of Agricultural and Biological Engineering first in the nation in 2006 and 2007. According to Science Watch [Nov/Dec 2006] Illinois ranked 10th among U.S. universities in its impact on agricultural sciences during the period from 2001-2005. ACES ranks among the top 15 government and university research institutions worldwide in its impact on agricultural sciences.

University of Illinois Extension

Based on a Strategic Agenda developed in 2003, University of Illinois Extension [Extension] is rapidly becoming an entrepreneurial organization with a growing outreach/engagement profile and development of new revenue streams. Extension is sharpening the focus on impact, operational excellence, product leadership, customer intimacy, and partnerships. Extension is forming strategic collaborations across campus and with new public and private partners. The rapidly emerging outreach/engagement activities, as well as the ongoing programmatic elements, are aligned with campus goals, priorities, and progress indicators. Leading technologies are being responsively deployed to stage Extension to accomplish its mission in effective and efficient ways. Extension is ramping up the commercialization of IP/IT in the private as well as public sector, and by so doing is becoming staged to deliver high value programs that have impact on local, national, and global scales.

As a component of the College of ACES, Extension divides the state into five regions, each with a Regional Director who supervises regional staff, with two or three Centers per region. Center educators and specialists provide programming for the counties. In addition, there are several other locations with specialized missions, such as Business and Industry Services [BIS] at Naperville, the Chicago High School for Agricultural Sciences, and Wilbur Wright Community College in Chicago. An MOU to place a specialist at the Chicago Metropolitan Area Planning agency, CMAP, is awaiting signatures.

Extension has formal relations with the Colleges of Veterinary Medicine and Applied Health Sciences. Strategic collaborations also exist with the Academy for Entrepreneurial Leadership and faculty and scientists in the Colleges of Fine and Applied Arts, Education, Engineering, and Liberal Arts and Sciences, and campus units such as the National Center for Supercomputing Applications, Graduate School of Library and Information Science, School of Social Work, and the scientific surveys. Internships are another area of growth in cross-campus entrepreneurial activities with Extension providing off-campus linkages and experiences for students to apply their knowledge and skills in outreach and program delivery. Cross-campus engagement is increasingly important to broaden the disciplinary base and related faculty expertise to address priority issues in Illinois.

University of Illinois Office of Research [Illinois Agricultural Experiment Station]

The Illinois Agricultural Experiment Station [IAES] was established by federal and state legislation in 1887. It is administratively assigned to the College of ACES and is a directly reviewed subsidiary for Campus budget review purposes. The unit manages a portfolio of research projects underwritten by federal and state appropriations that are made by statute, as well as grants and contracts. IAES research encompasses programs in the College of ACES and in other units funded in part through the IAES. These units include the Colleges of Veterinary Medicine, Engineering, LAS, and Law, as well as the Illinois Natural History Survey.

Faculty and staff with research responsibilities in the College of ACES have some percentage of their appointment in the Illinois Agricultural Experiment Station. In identifying and responding to new opportunities, the IAES plays a leadership role in shaping the research efforts of faculty, departments, and programs in the College. The long-term strategic goal is to undertake new investments in research that are balanced between discovery and application, as well as between long-term and short-term outcomes, to ensure both creativity and relevance to the state's food, agricultural, environmental, and human interests. To produce science that matters, the research portfolio demands strong entrepreneurial motivation, as well as elements that are very responsive to those with a stake in the food system. More than ever, our research must respond swiftly to the rapid pace of change in today's era of globalization.

Modifications Made to the Plan of Work

The most consistent request across all the planned programs in the reviewer comments for the previous Plan was that goals be more specific. In response to this request, the Department Heads reviewed the College-wide CSREES-funded portfolio of research projects and drafted revised goals based on what they identified as main themes. The revised goals are included in this year's Plan. The reviewers also requested that the rather general Outcome Indicators included in the previous Plan be replaced with more specific ones, and this has been done for this year's Plan.

In the previous Plan of Work the research SY's, publications, and number of terminated projects were calculated based on the knowledge areas that were included for each planned program [and included all projects under that knowledge area]. This year the methodology was modified to include all knowledge areas, but to include data for Hatch projects only. In other words, we included minor knowledge areas that were not included previously, but more importantly we deleted projects [most significantly grants] that had been included previously. As a result, numbers reported this year will vary significantly from the estimates made last year, but these differences result from a change in methodology more so than from a change in the overall research portfolio.

The decision was also made to fold the Animal Genomics planned program into the Animal Health and Production planned program. This was done because Animal Genomics has only a handful of Hatch projects and very little Extension activity.

Although some indicators of outcomes have been added, additional efforts will be made to add to and refine the list as Extension programs are targeted for evaluation of impact and methods identified to gather that impact. This plan also reflects reduction in projected numbers of individuals who will experience knowledge change or implement practices to more accurately reflect actual efforts of Extension staff to measure indicators and document impact. Attention will be given to increasing the number of impact evaluations and data collected in the coming year. Reduction in FTE's for Extension is reflective of the actual hours of work reported against knowledge areas related to the planned programs.

Executive Summary Of The Planned Programs

4-H Youth Development - In an effort to involve 50,000 new youth in 4-H by 2013, four core areas related to SET are targeted for statewide scale-up. These include: 1) robotics, 2) geospatial technologies and community mapping, 3) sustainable energy, and 4) exploring the Wonders of Science (SET Career Exploration). Specific activities will include SET-focused cable programming, internship experiences for college students, a mobile science laboratory, summer career academies, and digital observatories to connect youth and scientists in collaborative science investigations. In addition to the new Wind as Energy curriculum, a youth community informatics curriculum will be developed and offered through 4-H community clubs, special-interest groups, and after-school groups. Activities such as Health Jam, a multi-session program that focuses on healthy eating and physical activity practices and health careers, as well as the 36 Get Up and Move lesson plans for group meetings are examples of program activities related to Healthy Lifestyle development. Leadership, service learning, and character education will receive continued focus. 4-H Youth Development Extension staff are also involved in interdisciplinary efforts with other Extension staff to assist schools with social and emotional learning and healthy relationships school classroom curricula

and activities. Research activities in the College of ACES related to youth development are encompassed in the Human Development and Family Wellbeing Planned Program

Agricultural and Biological Engineering - Research activities include developing methods and techniques to reduce spray drift and to provide adequate coverage for controlling pest problems in field crops, research on agricultural infotronic systems and mass flow sensing, work to improve the application of pest control substances, research focusing on subsurface tile drainage systems, experiments to observe the nanostructure and the dynamics of zein protein aggregation, studies improving indoor air quality through contaminant control measures and improved ventilation design, and research to investigate the perceived effectiveness of innovative technologies to enhance teaching and learning. Extension activities will include web site expansion, online quizzes and training sessions to certify livestock managers are knowledgeable about manure management, and to ensure detection and mitigation of radon in homes.

Agricultural and Consumer Economics - Research activities include a cost/benefit analysis of natural resource policies [such as the impact of contaminated rivers in Wisconsin and New York on local property values], a study of the function and performance of rural finance markets, and an investigation of the variety selection process followed by Illinois soybean producers. Activities also include an analysis of the legal issues affecting agriculture, a study of agricultural and rural financial markets, research on the management of grain quality and security for world markets, an evaluation of risk management alternatives for Illinois farmers, and research on regulatory impacts on small public water supply systems. Extension activities encompass farm financial management including risk management, personal financial management, consumer health care options, housing decisions with respect to purchase and financing, and planning ahead for retirement.

Animal Health and Production - Research activities include a study to enhance sow productivity through maximizing mammary gland growth during lactation, development of methods to improve the rate and efficiency of muscle growth in livestock, an investigation of the use of distiller grains as a corn replacement feed for cattle, work to modify milk fat composition for improved nutritional and market value, a study designed to understand the micro-environment conditions of pigs during transport, monitoring of resistance genes in water and soil in close proximity to swine production facilities, a risk assessment of mycotoxins as they relate to biosecurity and food safety, and an investigation of the continued need for improved poultry handling even after implementation of the HACCP system. Animal genomics work supported by Hatch funds includes using genetic and functional approaches to improve the production quality of pork, using gene expression profiles to try to predict for genetic merit for milk production traits in dairy cattle, and using genetic selection and crossbreeding to enhance reproduction and survival of dairy cattle. Extension activities will include expansion and updating of the Illinois Livestock Trail web site and regional programs on livestock production for specific species of livestock such as the Illinois Horse Breeder's Short Course, Swine Reproductive Programming for Spanish Speaking Employees, Illinois Dairy Days, and Pet Extravagana. Programming on pasture management for livestock production via demonstrations, distance education, and web delivery will be a continuing focus. The livestock ethics training and on-line certification for new 4-H members enrolled in livestock and pork quality assurance training for youth are also major program activities that will be conducted.

Biofuels - We will combine and focus the specialized research abilities of faculty members from several disciplines to generate chemicals and biofuels from renewable biomass sources using a comparative and functional genomic approach. Future economic development aspects include technology transfer, biotech startups, attraction of national talents including faculty, students and postdoctoral associates, and training of a first-class workforce. Research is also focusing on perennial rhizomatous grasses, such as switchgrass and Miscanthus, which are particularly well-suited as bioenergy crops. Work is also being conducted to evaluate the impact of biofuels on emissions reducing technologies for off-road diesel engines.

Community Resource Planning and Development - Activities include evaluating the economic viability of community-based food systems, assessing the economic development of great rivers rural communities, studying how community factors affect children's social competence, a large assessment project of 16 communities in Southern Illinois, and understanding the employment and financial security of immigrant men and women working in the Midwest. Extension activities will focus on leadership development, community planning, development of community organizations, and economic development. Examples include leadership academies, building facilitation skills through U-facilitate citizen training, and the new Community Assessment and Development Services [CADS] program. CADS will prepare Extension staff in collecting, analyzing, interpreting, and disseminating information on social, economic, and demographic trends, who will then provide this information and help communities and organizations to base decisions and projects on this data. An additional new initiative is Resource Net: The Illinois Funding Access Network, a collaborative effort to increase the long-term capacity of nonprofit agencies and municipalities to secure state, foundation, and corporate resources. Other activities led by Extension educators will further focus on agricultural entrepreneurship, small business development, diversity, recreation and tourism development, and local

governance and public policy [through Certified County Officials multi-topic training].

Food Product Development, Processing and Safety - Extension activities include workshops, web site postings and presentations that focus on safe food handling in homes, commercial entities, and public settings. Research activities include an investigation of acoustic energy as a practical food safety intervention for fruit and vegetable juice processing, studying the effects of bioactive dietary chemicals on human health and food safety, research on the applications of edible films and coatings, an analysis of aroma-active components of foods, a study of pre-treatment effects on color of irradiated beef and pork, and work to improve barrier properties of biobased packaging films.

Human Development and Family Wellbeing - Extension activities will focus on aging and intergenerational issues including care-giving roles and coping strategies, family and individual resiliency including balancing work and family life and handling various life crises, developing healthy relationships, and building parenting skills for specific ages of children. Delivery methods will include maintenance and expansion of the Parenting 24/7 website, fact sheets and brochures such as the Your Young Child series, workshops including those on caregiving relations and managing the challenges of contemporary working life [Intentional Harmony curriculum], video/dvd's, and newsletters including Parenting Again [for grandparents raising grandchildren]. Research activities include a longitudinal study designed to help couples manage work and family life while maintaining intimacy and keeping conflicts constructive, a preventive intervention program [More Fun With Brothers and Sisters] designed to increase pro-social sibling relationships, expansion of the Child Development Laboratory Research Database, work with parents to identify those with the potential for safe and effective co-parenting after divorce despite a history of violence, an effort to identify chronic stressors in the lives of low-income, African American families living in low-resource, high-risk neighborhoods and the coping strategies used to address these stressors, and an effort to assess the strengths and needs of gay/lesbian parents and their children in downstate Illinois.

Human Nutrition, Diet Adequacy, Health and Wellbeing - Activities include the study of genistein [the principal soy isoflavone] in relation to estrogen-related breast cancer treatment, developing low-cost methods to increase protein in the diets of people in developing countries, identifying feasible strategies to treat gastrointestinal failure, investigating the importance of calcium on osteoporosis prevention, examining the health-promoting properties of broccoli, and understanding the mechanisms of fat deposition/mobilization on obesity. Extension activities will address diet planning, food selection, cooking methods, and exercise with respect to maintaining health and mitigating the effect of such diseases as diabetes and osteoporosis. Special activities to promote physical activity and mitigate disease transmission will also be addressed. Live Well, Be Well is a new applied research and Extension program that will be launched to achieve the adoption, implementation, and evaluation of an enhanced evidence-based chronic disease self-management program for adults with chronic illness in traditionally underserved areas.

Natural Resources and the Environment - Research has focused on developing, improving, and evaluating watershed models and other approaches for TMDL development and implementation, GPS as-applied mapping as a cost effective method of improving manure application accountability, recordkeeping, and accurate nutrient utilization, enhancing commercial production of floriculture crops by identifying plants that tolerate or negatively impact insect populations, a study of dispersal and disease transmission by rotation-resistant western corn rootworm, and a study of the link between microbial community composition and denitrification in natural, restored and constructed wetlands. Extension activities will include statewide tillage seminars, soil and water workshops, conservation days [for youth], natural resource management online courses for Certified Crop Advisors, and pond management seminars and demonstrations. Extension will continue to play a lead role in the Governor's Biennial Conference on the Management of the Illinois River System. New activities for the year will include the release of a website addressing human/wildlife interactions and the expansion of the Master Naturalist program. The Master Naturalist program will provide science-based educational opportunities that connect people with nature and help them become engaged environmental stewards. The program will address the need for environmental sustainability and stewardship in a state that is undergoing increasing urbanization, changing demographics, shifting land use, and undergoing a decline in outdoor recreational and educational activity use.

Plant Health, Systems and Production - Activities include the use of asexual techniques for plant improvement [especially important given public concern over genetically modified crops], development of strategies to measure and manage phytophthora blight of pumpkins [Illinois ranks first in the nation in pumpkin production], a study of the impact of ozone pollution on soybean, efforts to assess crop rotation effects in Illinois, and a very long-term study of corn for oil and protein content. Extension activities in this program area will address alternative agriculture production, invasive and/or exotic pest diagnosis and management, integrated pest management, competitive production practices for field crops, and best management practices for transgenic crops including resistance management. Extension activities for field crop and commercial

horticulture will include statewide conferences, workshops, field days, and mass media. Another set of activities that includes web sites, distance education presentations, a diagnostic system, and volunteer [Master Gardener] and business employee training will be delivered to audiences concerned with home lawn and garden production and wise use of limited water resources.

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

Year	Extension		Research	
	1862	1890	1862	1890
2009	250.0	0.0	125.0	0.0
2010	250.0	0.0	125.0	0.0
2011	250.0	0.0	125.0	0.0
2012	250.0	0.0	125.0	0.0
2013	250.0	0.0	125.0	0.0

II. Merit Review Process

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

- Internal University Panel
- External Non-University Panel
- Combined External and Internal University Panel
- Other (Extension Staff Program Teams)

2. Brief Explanation

Research and outreach projects and programs have always been exposed to a review process. Formula funded research projects undergo a merit review process at the departmental level by at least three faculty members in a related discipline to insure the projects are scientifically sound, relevant to society's needs, and not duplicative of efforts undertaken elsewhere. Formula projects are then submitted to CSREES for final review and approval. Internal research grants are all reviewed internally.

In Extension all projects are reviewed at several points in the system. Whenever local programming involves the delivery of programming by Extension educators, as it usually does, the programs are reviewed by the state subject matter teams of professional staff, including specialists. Curriculum materials are sometimes sent for review directly to peers in other states and 4-H curriculum materials are often sent through a national jury process in order for them to be shared across state lines. In addition, during annual performance reviews much attention is given to programming quality. Finally, Extension programs are continuously evaluated in terms of inputs, program content and delivery, outputs, and outcomes. While not every project is evaluated in this fashion, programming in all core program areas is reviewed extensively on an annual basis.

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?

Extensive consultation is ongoing with stakeholders on both a formal and informal basis to help establish program priorities that are reflected in the planned programs included in the Plan of Work. The College of Agricultural, Consumer and

Environmental Sciences [ACES] has drafted a strategic plan to guide the college within the context of the larger University of Illinois community. The development of research and Extension agendas are driven by the needs of the state as expressed by advisory councils at the state [such as C-FAR and State Extension Advisory Council], departmental, and local levels and by formal assessment of stakeholder needs.

Peer interaction within Extension program development teams to discuss priority issues identified by stakeholder advisory groups helps Extension and research staff identify opportunities for integrating their efforts. Interactions of College research and Extension faculty and staff at out-of-state and national conferences and professional associations provide opportunities to identify multi-state interest in research and Extension program development. Examples of critical issues addressed through integrated and multi-state activities include: 1) exotic and invasive pest management addressed through the multi-state Digital Diagnostic System, 2) demand for locally grown food, a focus of the Agroecology/Sustainable Agriculture Program of the north central states, 3) land use issues addressed in fact sheets written in Indiana and Ohio and distributed in Illinois through the Local Government Information and Education Network, 4) bioenergy development, the focus of the North Central Bioenergy Consortium, and 5) environmental problems addressed through coordination of many entities of the University to develop innovative responses to these problems.

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

Considerable efforts have been made and continue to be made to ensure that nontraditional stakeholders are given a voice in identifying needs to be addressed and in shaping the research and programmatic responses to these needs through membership on college and Extension advisory groups and through formal and informal input through planned needs assessment. Currently 12.1 % percent of the web page "hits" received by the Urban Extension website are now for Spanish sites. More than 50 websites are available in Spanish as well as one in Arabic. The integrated research and Extension Diabetes Educational project has a website version in Spanish. The New Horizon Spanish Radio Program originating from the University of Illinois College of ACES is distributed weekly and broadcast by stations in 24 states. Marketmaker, a multi-state activity, connects food producers with ethnic restaurant owners in urban areas.

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

Hatch multistate projects represent a significant component of the total Hatch portfolio. Both Hatch and Multistate Hatch projects are reviewed on an annual basis when deciding which projects to feature in the Plan of Work and Annual Report. Of course, projects included represent only the Illinois research portion of a given program. Multistate committees publish an Annual Report of their work which allows stakeholders to view the impact of the project on a regional or national basis. When selecting programs to be included in the Plan of Work, special attention is given to including those that display a significant Extension/research partnership. Examples currently include programs supporting agribusinesses [Farmdoc], working families [Intentional Harmony], agricultural markets [MarketMaker], and work focused on rural development. Individuals providing leadership for multi-state and integrated activities will be asked to submit a report that includes documentation of the indicators of outcomes and impacts. Opportunities to share information regarding the indicators of outcomes and impacts of these reports include the ACES Afield newspaper [the annual College of ACES update supported by integrated funds] that details activities for stakeholders who receive the publication. The past and anticipated outcomes and impact will also be noted in marketing and promotion of the activities to targeted participants.

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

Multistate projects play a unique role in the ACES research portfolio. Multistate research allows researchers to collaborate with other investigators on issues that are of regional [and in some cases national] significance, to develop new relationships which may lead to further collaborations, and to interact with top scientists who share similar research interests, but also bring to the table viewpoints from stakeholders in their part of the country which may be significantly different. Joint activities are also especially important in that they allow Extension educators to have access to cutting-edge research while at the same time allowing investigators to receive input from stakeholders through their participation in Extension programs. Multistate Extension activities are expected to prevent duplication of work and allow sharing of expertise across state lines. Extension multistate conferences and distance education delivery will tap the varied expertise of university faculty and staff in each state. Likewise, many planned multistate and integrated activities involve delivery through websites that have no geographical boundaries. Output targets in terms of participation, academic publications, and research projects completed provide a basis for monitoring research and Extension program implementation. Measures of outcomes provide a basis for estimating program effectiveness. The monitoring of both kinds of measures provides a basis for determining effectiveness, a necessary precursor to determining efficiency.

IV. Stakeholder Input

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

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

Brief explanation.

It should be noted that not every technique is used every year. All programs in the College are continually subjected to a diverse process of stakeholder input. The College, the Office of Research, the Office of Extension and Outreach, academic departments, and many programs within the College have advisory groups and councils made up of stakeholders. In this context, stakeholders may represent organized entities in the state with a particular interest in a program area, but they also include individual stakeholders.

The Office of Research has an especially powerful process of stakeholder input through the Illinois Council on Food and Agricultural Research [C-FAR]. C-FAR represents stakeholders throughout the state such as organizations dealing with environmental quality and resource conservation issues, sustainable agriculture groups, commodity groups, and rural development interests. The membership of C-FAR has had an ongoing, very active, and very influential role in defining needed research and outreach outcomes for the work of the College. Extension, in addition to its advisory council structure, from local [county-level] councils through regional councils and a statewide council, also has other mechanisms in place for continuous stakeholder input.

Local councils are volunteers nominated locally and appointed by the College to provide advice on educational programming. The makeup of the councils reflects local populations and local participation in Extension programs. In addition, University of Illinois Extension has an ongoing process of program planning. The program planning process starts at the local level and is characterized by systematic collection of information from a wide variety of sources and from stakeholders who are particularly interested in program delivery in that area. During the program planning process, special effort is made to include representatives from diverse and potential audiences in the program planning process. The Extension State Program Planning Committee is currently designing the next statewide process for systematic input from stakeholders that may include surveys to serve as the basis for the long-range multi-year state and local plan of work. In the interim, local Extension Council meetings will be announced and open to the public and are scheduled on a regular basis. In the pursuit of grants, Extension staff will target both traditional and non-traditional individuals and groups with invitations to provide input required by grantors.

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 Surveys
- Use External Focus Groups
- Use Advisory Committees
- Use Internal Focus Groups
- Needs Assessments

Brief explanation.

A variety of methods and techniques are used to identify individuals and groups. As part of the University of Illinois Extension Affirmative Action plan, County Extension Directors, Extension Educators and Specialists identify individuals to serve on formal local, regional, and state advisory groups for Extension and the College. These groups will play a key role in identifying research and Extension priority activities, as well as suggesting others who should be contacted. In addition, Extension staff are

actively involved in community collaborations at the local level and will use these contacts to provide input or suggestions for other stakeholders that should be contacted. Extension leadership at the regional and state level also networks with traditional and non-traditional internal and external individuals and groups and will use these contacts to provide opinions and suggestions for other key stakeholders that might provide direction for research and Extension.

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 invited selected individuals from the general public
- Survey of traditional Stakeholder individuals
- Meeting with traditional Stakeholder groups
- Survey of traditional Stakeholder groups
- Meeting specifically with non-traditional individuals
- Meeting with traditional Stakeholder individuals
- Meeting specifically with non-traditional groups
- Survey of selected individuals from the general public

Brief explanation

C-FAR members provide their firsthand input through working groups formed around five areas of research: expanding agricultural markets, rural economic development, agricultural production systems, human nutrition and food safety, and natural resources and the environment. Members are engaged in varying degrees in all C-FAR-funded research programs to identify the highest priority research needs and opportunities for the state. The ABG "Vision for Illinois Agriculture" initiative will provide additional stakeholder input. Until the Extension statewide stakeholder input process is designed for implementation in the fall of 2008, planned programs will continue to draw from previous input through focus groups to gather youth and family issues surveys of community leaders to identify community resource and development issues, and meetings and interviews with agricultural interest stakeholders and feedback collected from program participants at the completion of a given program. Local programs will receive continued assessment and adjustment based on input from Extension Councils. All methods of collecting data that are checked will likely be used to design a specific activity related to one of the eleven planned programs included in this Plan of Work.

3. A statement of how the input will be considered

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

Brief explanation.

Continuation, redirection, or initiation of new research and Extension programs draws heavily on stakeholder input drawing from formalized groups and various needs assessment methods. Stakeholder input will play a major role in developing and updating University of Illinois Extension's long-range plan of work. In addition, the input from research and Extension advisory groups may be considered in budgeting and allocating or reallocating funds. Stakeholders will likely be influential in expressing their needs to local, state, and federal government officials responsible for continuing, restoring, or increasing funding for research and Extension and from private entities. Local Extension Advisory Councils will be involved in identifying staffing needs and selected individuals or other knowledgeable stakeholders may be involved in providing input on potential candidates for positions.

V. Planned Program Table of Content

S. NO.	PROGRAM NAME
1	Plant Health, Systems and Production
2	Community Resource Planning and Development
3	Animal Health and Production
4	Natural Resources and the Environment
5	Human Nutrition, Diet Adequacy, Health and Wellbeing
6	Food Product Development, Processing and Safety
7	Agricultural and Consumer Economics
8	Biofuels
9	Human Development and Family Wellbeing
10	4-H Youth Development
11	Agricultural and Biological Engineering

V(A). Planned Program (Summary)

Program #1

1. Name of the Planned Program

Plant Health, Systems and Production

2. Brief summary about Planned Program

Research at the University of Illinois and its partners covers the gamut of approaches from basic plant research to applied research all leading to improving production both commercially and for the home grower. Through the Illinois-Missouri Biotechnology Alliance, Illinois partners with others to strengthen the agriculture and food sectors of the American Midwest while seeking to improve food quality and safety.

As a contributing partner to the North Central states Integrated Pest Management Program [IPM], Illinois research and Extension supports the combination of research/Extension implementation projects, the development of individual pest control tactics, as well as Extension education and training. Funded research addresses emerging concerns such as the control of exotic, invasive weeds and pest management for the production of organic vegetable crops.

Extension program teams [Crops, IPM, and Horticulture] are composed of both Extension educators and State Extension Specialists who are both faculty members and research scientists. This provides the opportunity for further integration of research and Extension functions.

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 : Yes

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	0%		10%	
202	Plant Genetic Resources and Biodiversity	0%		10%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		10%	
205	Plant Management Systems	30%		10%	
206	Basic Plant Biology	0%		10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	35%		5%	
212	Pathogens and Nematodes Affecting Plants	0%		20%	
213	Weeds Affecting Plants	0%		10%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		5%	
216	Integrated Pest Management Systems	30%		10%	
	Total	100%		100%	

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

1. Situation and priorities

Illinois producers strive to produce a wide variety of crops that are affordable to consumers while at the same time produced in a manner that is environmentally responsible. College of ACES researchers are working with producers to advance and document the frontiers of plant sciences and applicable disciplines to improve the quality and quantity of plants and their products, including food, feed, fuel, and fiber production while at the same time developing and enhancing plant production systems that integrate pest and other management practices while protecting the environment. Extension specialists are instrumental in meeting the educational needs of the largest network of certified crop advisors [over 1,500 in Illinois] in the United States. Many educational programs are directed at farmers who produce field crops [26 million acres in Illinois]. In addition, successful and highly visible Extension programs are delivered to fruit and vegetable growers [at least 64 vegetables and 15 fruit crops are produced commercially in Illinois].

Extension priorities include addressing the threat of new invasive or exotic pests that affect the quality and economics of crop production, management of transgenic crops, development of pest resistance in crops and the safe and effective use of pesticides and fungicides in agriculture, commercial horticulture, and lawn and garden management. Protection of the

environment also includes wise use of water affected by land use requirements and weather extremes in precipitation. Extension addresses these priority issues and also includes efforts to respond to the demand for good horticulture information by homeowners. Extension is also aware and involved in developing a response to the growing interest in local foods systems.

2. Scope of the Program

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

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

1. Assumptions made for the Program

While a safe and affordable food supply will always be a top priority, we expect that other areas of plant production will continue to play an important role in driving interest [such as the demand for organic foods and biofuel inputs].

2. Ultimate goal(s) of this Program

To maximize the benefits from specialty crop production systems, to conduct cutting edge research that will increase crop production with minimal energy input and minimal negative impact on the environment and translate the results to producers and their advisors, to identify techniques that will obviate crop production factors that result in degradation of the environment, and to increase the number of PhD graduates in plant breeding and expand research in plant breeding. Extension will extend the achievement of these research goals so that individuals responsible for field crops, commercial horticulture production, and home yard and garden care will gain knowledge and apply that knowledge through the most economically viable management practices while using safe and recommended pest control measures and conservation of water to ensure the preservation of natural resources.

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	41.5	0.0	29.0	0.0
2010	41.5	0.0	29.0	0.0
2011	41.5	0.0	29.0	0.0
2012	41.5	0.0	29.0	0.0
2013	41.5	0.0	29.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Activities include the use of asexual techniques for plant improvement [especially important given public concern over genetically modified crops], development of strategies to measure and manage phytophthora blight of pumpkins [Illinois ranks first in the nation in pumpkin production], a study of the impact of ozone pollution on soybean, efforts to assess crop rotation effects in Illinois, and a very long-term study of corn for oil and protein content. Extension activities in this program area will address alternative agriculture production, invasive and/or exotic pest diagnosis and management, integrated pest management, competitive production practices for field crops, and best management practices for transgenic crops including resistance management. Extension activities for field crop and commercial horticulture will include statewide conferences, workshops, field days, and mass media. Another set of activities that includes web sites, distance education presentations, a diagnostic system, and volunteer [Master Gardener] and business employee training will be delivered to audiences concerned with home lawn and garden production and wise use of limited water resources.

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 ● Education Class ● Other 1 (Digital Diagnostics System) ● Workshop ● Group Discussion ● Demonstrations 	<ul style="list-style-type: none"> ● TV Media Programs ● Web sites ● Newsletters

3. Description of targeted audience

The target audiences include agricultural producers, horticulturists, individuals interested in organic and other alternative food production, industry representatives, retail employees, homeowners, and master gardeners.

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	55000	45000	4000	0
2010	55000	45000	4000	0
2011	55000	45000	4000	0
2012	55000	45000	4000	0
2013	55000	45000	4000	0

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

Expected Patent Applications

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

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	85	1	86
2010	85	2	87
2011	85	1	86
2012	85	2	87
2013	85	2	87

V(H). State Defined Outputs

1. Output Target

- Number Of Completed Hatch Research Projects

2009 8

2010 8

2011 :8

2012 8

2013 8

V(I). State Defined Outcome

O. No	Outcome Name
1	Percentage Of Nitrogen Utilization By Wheat
2	More Careful Use Of Garden Chemicals (Pesticides, Fungicides, Fertilizer) And Water
3	Changes In Application Of Recommended Pest Control Practices For Field Crops
4	Increased Knowledge Of Pest Management In Field Crops
5	Self-Reported Increased Use Of Transgenic Crops And Pest Resistant Crop Varieties

Outcome #1

1. Outcome Target

Percentage Of Nitrogen Utilization By Wheat

2. Outcome Type : Change in Knowledge Outcome Measure

2009 52 **2010** : 53 **2011** : 55 **2012** 57 **2013** :60

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems

Outcome #2

1. Outcome Target

More Careful Use Of Garden Chemicals (Pesticides, Fungicides, Fertilizer) And Water

2. Outcome Type : Change in Action Outcome Measure

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

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 214 - Vertebrates, Mollusks, and Other Pests Affecting Plants
- 216 - Integrated Pest Management Systems

Outcome #3

1. Outcome Target

Changes In Application Of Recommended Pest Control Practices For Field Crops

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

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems

Outcome #4**1. Outcome Target**

Increased Knowledge Of Pest Management In Field Crops

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

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants
- 216 - Integrated Pest Management Systems

Outcome #5**1. Outcome Target**

Self-Reported Increased Use Of Transgenic Crops And Pest Resistant Crop Varieties

2. Outcome Type : Change in Knowledge Outcome Measure**2009** :400**2010** : 400**2011** : 400**2012** :400**2013** :400**3. Associated Institute Type(s)**

•1862 Extension

4. Associated Knowledge Area(s)

- 205 - Plant Management Systems
- 211 - Insects, Mites, and Other Arthropods Affecting Plants
- 212 - Pathogens and Nematodes Affecting Plants
- 213 - Weeds Affecting Plants

V(J). Planned Program (External Factors)**1. External Factors which may affect Outcomes**

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

Description

Since a great deal of plant research is done in the field rather than the laboratory, it is much more difficult to control for confounding variables, any one of which can make results more difficult to interpret. Examples include unusually harsh [or unusually mild] growing seasons, unforeseen invading pests, and contamination from outside pollutants. These are especially important given the long time horizon of many plant studies. These same factors affect decisions that producers and homeowners make with respect to their crop, lawn, and garden management.

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

1. Evaluation Studies Planned

- During (during program)
- Retrospective (post program)
- After Only (post program)

Description

A study involving the practice changes by participants at the Corn and Soybean Classic conferences is anticipated but not yet designed.

Retrospective evaluations of one or two segments of home horticulture distance education programs will once again be conducted.

2. Data Collection Methods

- Other (email invitation to on-line surv)
- On-Site
- Tests
- Observation
- Whole population
- Sampling

Description

Data collection methods include field studies, transition trials, evaluations from research and Extension conferences, greenhouse studies, and harvesting of yield plots.

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

Community Resource Planning and Development

2. Brief summary about Planned Program

Dramatic changes in the United States and around the world are altering individual life courses and the communities in which people live. These fundamental social and economic shifts have created new challenges for communities and their citizens. Leadership for community development in the College of ACES rests with the Department of Human and Community Development [HCD] and the University of Illinois Extension Community and Economic Development program team. Faculty members engage in teaching, research, and outreach to improve the lives of children, youth, and adults in the contexts of their communities and society. Research interests of faculty include community infrastructure, community capacity and leadership, community organizing, and small-town change.

University of Illinois Extension through Extension educators and locally funded educators helps communities, organizations, businesses, and leaders by providing practical, research-based information and programs to address local needs whether rural or urban.

A unique feature at the University of Illinois is the partnership between the Department of Human and Community Development, University of Illinois Extension, and others as expressed through the Laboratory for Community and Economic Development. This venture helps to coordinate research and educational programs in community and economic development. The Lab's staff work with researchers, economic development practitioners, business leaders, Extension educators, and others across the country, bringing information and expertise to state and local policy makers, agricultural and business leaders, community leaders, and Illinois citizens.

Extension programs focus on enhancing civic engagement, improving the business climate and economic development, and developing community-based infrastructure and organizations. Within these broad areas are programs on leadership and local leader development and education, organizational development, local governance, community planning, recreation and tourism development, agricultural entrepreneurship, small business development, workforce development, community economic development, and diversity education. Exploration of the feasibility of developing and expanding local food systems relates to this program area as well as the Plant Health, Systems, and Production Planned Program. Community Assessment and Development Services [CADS], a major new initiative launched in 2008, will continue to progress in providing information on social, economic, and demographic trends in support of community and regional analysis. Given the challenges faced by Illinois communities whether small towns or villages or an urban neighborhood, this Planned Program will play an important role in assisting communities and their citizens in addressing these needs.

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 : Yes

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

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	75%		50%	
802	Human Development and Family Well-Being	5%		15%	
803	Sociological and Technological Change Affecting Individuals, Families and Communities	5%		10%	
805	Community Institutions, Health, and Social Services	10%		15%	
806	Youth Development	5%		10%	
	Total	100%		100%	

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

1. Situation and priorities

Many communities in Illinois are experiencing declines and changes in population and a declining economy. These communities are characterized by the lack of viable community organizations, businesses, workforce opportunities, and recreation opportunities. These communities may also be characterized by a lack of planning and a shortage of leadership and of local officials with information, tools, and skills to revitalize their communities.

2. Scope of the Program

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

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

1. Assumptions made for the Program

That citizens given training and information are best equipped to determine the ultimate solutions to the problems they and their communities face, that local policies and environments can in turn influence business and economic development, and that resources [local, state and federal] will remain at a high enough level to fund the needed research and extension programs.

2. Ultimate goal(s) of this Program

Researchers are studying community activism, mobilization, and leadership in rural communities to assist in developing strong institutions that will foster revitalization of rural life. Extension seeks to increase the knowledge and skills of current and future leaders of local government, organizations, and agencies to improve the economic and social conditions of targeted communities.

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	65.0	0.0	3.5	0.0
2010	65.0	0.0	3.5	0.0
2011	67.0	0.0	3.5	0.0
2012	67.0	0.0	3.5	0.0
2013	67.0	0.0	3.5	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Activities include evaluating the economic viability of community-based food systems, assessing the economic development of great rivers rural communities, studying how community factors affect children’s social competence, a large assessment project of 16 communities in Southern Illinois, and understanding the employment and financial security of immigrant men and women working in the Midwest. Extension activities will focus on leadership development, community planning, development of community organizations, and economic development. Examples include leadership academies, building facilitation skills through U-facilitate citizen training, and the new Community Assessment and Development Services [CADS] program. CADS will prepare Extension staff in collecting, analyzing, interpreting, and disseminating information on social, economic, and demographic trends, who will then provide this information and help communities and organizations to base decisions and projects on this data. An additional new initiative is Resource Net: The Illinois Funding Access Network, a collaborative effort to increase the long-term capacity of nonprofit agencies and municipalities to secure state, foundation, and corporate resources. Other activities led by Extension educators will further focus on agricultural entrepreneurship, small business development, diversity, recreation and tourism development, and local governance and public policy [through Certified County Officials multi-topic training].

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 ● Group Discussion ● Other 1 (Audio/Video Conferencing) ● Education Class ● Workshop 	<ul style="list-style-type: none"> ● Other 1 (Self Study) ● Web sites

3. Description of targeted audience

Audiences include government agency representatives, community leaders, youth, water infrastructure professionals, academics working on community infrastructure issues, residents of the New Madrid Seismic Zone, individuals interested or engaged in starting small businesses, and local government officials involved in community and economic development.

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	25000	40000	500	0
2010	25000	40000	500	0
2011	25000	40000	500	0
2012	25000	40000	500	0
2013	25000	40000	500	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	10	1	11
2010	10	1	11
2011	10	1	11
2012	10	1	11
2013	10	1	11

V(H). State Defined Outputs

1. Output Target

- Number Of Completed Hatch Research Projects

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

V(I). State Defined Outcome

O. No	Outcome Name
1	Number Of Individuals Who Worked On/Gave Leadership To Specific Community Issues
2	Community Leaders Who Used Information And Data In Making Decisions That Improved Local Communities Or Organizations
3	Percent Completion Of A Community's Plan/Goals [Number Reported Will Be The Number Of Communities Reporting Progress On Their Community Plan Along With The Percent Completion]
4	Dollar Value Of Grants And Resources Leveraged/Generated [Includes Gifts, Grants, Private Investments, Equipment, Workforce Training, Budget Allocations, Etc.]

Outcome #1

1. Outcome Target

Number Of Individuals Who Worked On/Gave Leadership To Specific Community Issues

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

4. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families and Communities
- 805 - Community Institutions, Health, and Social Services
- 806 - Youth Development

Outcome #2

1. Outcome Target

Community Leaders Who Used Information And Data In Making Decisions That Improved Local Communities Or Organizations

2. Outcome Type : Change in Action Outcome Measure

2009 :100 **2010** : 200 **2011** : 300 **2012** #00 **2013** :400

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 802 - Human Development and Family Well-Being
- 803 - Sociological and Technological Change Affecting Individuals, Families and Communities
- 805 - Community Institutions, Health, and Social Services

Outcome #3

1. Outcome Target

Percent Completion Of A Community's Plan/Goals [Number Reported Will Be The Number Of Communities Reporting Progress On Their Community Plan Along With The Percent Completion]

2. Outcome Type : Change in Action Outcome Measure

2009 :10 **2010** : 30 **2011** : 40 **2012** #0 **2013** :40

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development
- 805 - Community Institutions, Health, and Social Services

Outcome #4**1. Outcome Target**

Dollar Value Of Grants And Resources Leveraged/Generated [Includes Gifts, Grants, Private Investments, Equipment, Workforce Training, Budget Allocations, Etc.]

2. Outcome Type : Change in Condition Outcome Measure

2009 :100000

2010 : 100000

2011 : 500000

2012 500000

2013 :500000

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 608 - Community Resource Planning and Development

V(J). Planned Program (External Factors)**1. External Factors which may affect Outcomes**

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

Description

Competing public and programmatic priorities can influence the level of attention provided to community economic development by non-subject matter staff such as County Directors, as can environmental conditions that affect areas such as water quality or the probability of future seismic activity, employment opportunities in a given community, migration into or out of the area, community funding for emergency preparedness, interactions between community, county, state, and national lawmakers and the impacts of national priorities on local issues.

V(K). Planned Program (Evaluation Studies and Data Collection)**1. Evaluation Studies Planned**

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

Description

Selected leadership academies are being evaluated using an instrument that was developed by a Missouri faculty members and individual evaluations of the 24 topical distance education programs in the Certified County Officials program. The director of community and economic development for University of Illinois Extension is working with the Extension staff to identify additional indicators and evaluation plans that will be collected statewide drawing on the work of the joint north central Extension program leaders in community and economic development.

2. Data Collection Methods

- Mail
- Structured
- Sampling
- Portfolio Reviews
- Other (on-line surveys)
- Whole population
- Unstructured

Description

Survey of leadership academy participants, community leaders, government officials, and business owners to determine knowledge gained and application of that knowledge. Interviews with those who have responsibility for overseeing the implementation of community or organizational plans and/or a review of minutes or documents that report accomplishments. Collecting information from participants, reviewing attendance records, and/or interviewing who would be able to provide information on the number of citizens who worked on specific community issues. Data collection and interviews with local officials to identify dollar value brought into a community through grants and resources as a result of Extension's involvement.

V(A). Planned Program (Summary)

Program #3

1. Name of the Planned Program

Animal Health and Production

2. Brief summary about Planned Program

Leadership for programs in animal science is provided by the Department of Animal Sciences of the College of Agricultural, Consumer and Environmental Sciences and the College of Veterinary Medicine.

Research programs range from those at the molecular level [molecular genetics] to applied research on farms and herds throughout the state. These programs cover all major species. Examples include the molecular mechanisms regulating skeletal muscle growth, tracking antibiotic resistant genes in swine, reproductive health, and optimization of animal welfare. Animal sciences is a strong component of the research and outreach efforts of the Colleges of ACES and Veterinary Medicine from the use of animals for food and fiber to their role as companions with human beings.

Extension and outreach is conducted by faculty and Extension educators throughout the state. Outreach includes an extensive internet presence through the Illinois TRAILLS portal located at <http://www.livestocktrail.uiuc.edu/>. Additionally, Extension programs are conducted on both a multi-state and in-state basis. Illinois Horse Breeders Short Course, Swine Reproductive Programming for Spanish Speaking Employees, Illinois Dairy Days, and Pet Extravaganza are examples of programs delivered by Extension staff to audiences who attend campus and off-campus sites. Programming on pasture management for livestock production is a continuing focus. Extension programs targeted at youth involved in the 4-H program include clinics, pork quality assurance training, judging and evaluation of animals, and animal care ethics. The animal system team combines faculty, researchers, and Extension educators to produce strong programs which integrate research and Extension.

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 : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
301	Reproductive Performance of Animals	5%		15%	
302	Nutrient Utilization in Animals	10%		15%	
303	Genetic Improvement of Animals	0%		10%	
305	Animal Physiological Processes	0%		15%	
307	Animal Production Management Systems	25%		10%	
311	Animal Diseases	30%		25%	
315	Animal Welfare, Well-Being and Protection	5%		10%	
806	Youth Development	25%		0%	
	Total	100%		100%	

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

1. Situation and priorities

Priorities in the Animal Health and Production Planned Program focus on production management [addressing new issues involving health, feeding, reproduction, genetics, and management] but also deal with issues that cut across several other planned programs, such as human development [companion and recreational animals], youth development [teaching youth about the importance of caring for animals and capitalizing on the animal as a tool for youth development], natural resource utilization [with an emphasis on environmental protection and water quality], agricultural economics [improving marketing skills and business planning], and of course food safety [developing educational programs that encourage participation in quality assurance, residue avoidance, and Hazard Analysis Critical Control Point [HACCP] programs].

2. Scope of the Program

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

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

1. Assumptions made for the Program

It is difficult to predict how recent issues related to animal health and the public concern over animal product safety will impact research and Extension programs. On the one hand it may dissuade consumers from purchasing animal products, but on

the other hand it may stress the importance of research and Extension programs as the most logical method for regaining public confidence. Concerns over animal treatment present a need that researchers and Extension educators are well positioned to meet. As resources continue to tighten at both the state and national levels every effort will be made to continue to serve these needs as they relate to both Illinois and national stakeholders.

2. Ultimate goal(s) of this Program

The goals of this planned program are to develop management practices that enhance efficiency of production by food-producing animals, to develop nutrition and management practices that optimize the health of domestic animals, to develop management practices that enhance animal well-being and minimize the impacts of animal production on the environment, to improve methods for diagnosis, prevention and treatment of infectious diseases in food animals, to develop new strategies to improve food safety, to educate animal producers and owners on keeping their animals healthy, and to educate veterinarians on the latest health information to best serve their clients.

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	16.0	0.0	25.0	0.0
2010	16.0	0.0	25.0	0.0
2011	16.0	0.0	25.0	0.0
2012	16.0	0.0	25.0	0.0
2013	16.0	0.0	25.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research activities include a study to enhance sow productivity through maximizing mammary gland growth during lactation, development of methods to improve the rate and efficiency of muscle growth in livestock, an investigation of the use of distiller grains as a corn replacement feed for cattle, work to modify milk fat composition for improved nutritional and market value, a study designed to understand the micro-environment conditions of pigs during transport, monitoring of resistance genes in water and soil in close proximity to swine production facilities, a risk assessment of mycotoxins as they relate to biosecurity and food safety, and an investigation of the continued need for improved poultry handling even after implementation of the HACCP system. Animal genomics work supported by Hatch funds includes using genetic and functional approaches to improve the production quality of pork, using gene expression profiles to try to predict for genetic merit for milk production traits in dairy cattle, and using genetic selection and crossbreeding to enhance reproduction and survival of dairy cattle.

Extension activities will include expansion and updating of the Illinois Livestock Trail web site and regional programs on livestock production for specific species of livestock such as the Illinois Horse Breeder's Short Course, Swine Reproductive Programming for Spanish Speaking Employees, Illinois Dairy Days, and Pet Extravagana. Programming on pasture management for livestock production via demonstrations, distance education, and web delivery will be a continuing focus. The livestock ethics training and on-line certification for new 4-H members enrolled in livestock and pork quality assurance training for youth are also major program activities that will be conducted.

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"> ● Demonstrations ● Workshop ● Education Class ● One-on-One Intervention 	<ul style="list-style-type: none"> ● TV Media Programs ● Web sites ● Newsletters

3. Description of targeted audience

The target audience includes all members of the animal production chain, from suppliers of inputs to producers to processors to final consumers. Other audiences include youth, veterinarians, owners of companion animals, vaccine manufacturers, animal nutritionists, livestock trailer manufacturers.

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	50000	25000	28000	0
2010	50000	25000	28000	0
2011	50000	25000	28000	0
2012	50000	22500	28000	0
2013	50000	25000	28000	0

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

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

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	70	1	71
2010	70	1	71
2011	70	1	71
2012	70	1	71
2013	70	1	71

V(H). State Defined Outputs**1. Output Target**

- Number Of Completed Hatch Research Projects

2009 :12 2010 :12 2011 :12 2012 :12 2013 :12

V(I). State Defined Outcome

O. No	Outcome Name
1	Percent Of Sequence In A 3x Coverage Of The Porcine Genome And Deposit It In A Public Database
2	Youth Passing A Livestock Ethics Knowledge Quiz After Participating In Extension Training
3	Increased The Grazing Rotational Rate Based On Forage Height

Outcome #1

1. Outcome Target

Percent Of Sequence In A 3x Coverage Of The Porcine Genome And Deposit It In A Public Database

2. Outcome Type : Change in Knowledge Outcome Measure

2009 :15 **2010 :** 15 **2011 :** 0 **2012 :** 0 **2013 :** 0

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 303 - Genetic Improvement of Animals

Outcome #2

1. Outcome Target

Youth Passing A Livestock Ethics Knowledge Quiz After Participating In Extension Training

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

4. Associated Knowledge Area(s)

- 315 - Animal Welfare, Well-Being and Protection

Outcome #3

1. Outcome Target

Increased The Grazing Rotational Rate Based On Forage Height

2. Outcome Type : Change in Action Outcome Measure

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

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 301 - Reproductive Performance of Animals
- 302 - Nutrient Utilization in Animals
- 307 - Animal Production Management Systems

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Consumer preferences for animal products are one important external factor [such as a preference shift from milk to bottled water or from beef to pork or chicken].Of the utmost importance is maintaining public confidence that animals are treated

humanely and that animal products are safe [two of the most recent high-profile concerns are mad cow disease and the recall of meat produced from culled dairy cows]. Changes in legislation and the increasing difficulty of maintaining funding and staffing levels are also very important external factors. In addition drought can affect grazing practices and profitability.

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

1. Evaluation Studies Planned

- Retrospective (post program)
- During (during program)

Description

An online survey targeted at participants in Extension livestock grazing programs or users of Extension livestock educational information will be conducted to determine practices changes over time and self-reports of economic return per acre. The survey will remain open this year for data collection and participation will be promoted through statewide media, personal contacts, and web site front page invitations to participate.

2. Data Collection Methods

- Whole population
- Other (Online Survey)

Description

Livestock grazing surveys will be conducted through an online survey distributed widely to Extension participants. Knowledge of ethical care of livestock by youth will be assessed through completion of an online quiz.

V(A). Planned Program (Summary)

Program #4

1. Name of the Planned Program

Natural Resources and the Environment

2. Brief summary about Planned Program

Leadership for Natural Resource Management programs through the University of Illinois is provided through a multidisciplinary approach as exemplified by the College of ACES Department of Natural Resources and Environmental Sciences [NRES].

Research topics of NRES faculty and affiliates explore ranges of subjects from aphids to zebra mussels, and everything from individual genes to the ecosystem of the planet earth. Hatch sponsored projects range from researching the relationship between how humans experience being part of nature and how that in turn influences environmentally responsible behavior to how chemical inputs from atmospheric deposition influence good nutrient management in both crop and forest systems. Of critical interest to both agriculture and ecosystem management is how fertilizer application affects nutrient management under various management scenarios.

Natural Resource Management Extension educators will team with Crops Extension educators to provide education to producers and others in tillage techniques and soil and water management workshops. Online courses will be operational to provide continuing education units to Certified Crop Advisors. Conservation days for youth and pond management workshops for rural and homeowner association residents will be delivered. A new website addressing human/wildlife interactions will be completed. A major new initiative, the training of Master Naturalists will be expanded statewide. The Master Naturalist program will provide science-based educational opportunities that connect people with nature and help them become engaged environmental stewards. The program will address the need for environmental sustainability and stewardship in a state that is undergoing increasing urbanization, changing demographics, shifting land use, and undergoing a decline in outdoor recreational and educational activity use.

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 : Yes

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	35%		30%	
112	Watershed Protection and Management	25%		15%	
123	Management and Sustainability of Forest Resources	5%		20%	
133	Pollution Prevention and Mitigation	5%		10%	
405	Drainage and Irrigation Systems and Facilities	5%		10%	
605	Natural Resource and Environmental Economics	5%		10%	
806	Youth Development	20%		5%	
	Total	100%		100%	

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

1. Situation and priorities

Ensuring a safe and adequate water supply is an issue in both urban and rural areas of Illinois. Chemical use by agricultural producers and homeowners and soil erosion are viewed as serious contaminants of water supplies. In addition, chemical use has been identified as affecting air quality and destroying beneficial plant life. Forestry management for timber, wildlife, or recreation is a high priority for landowners. Wildlife management concerns range from habitat enhancement to nuisance management. This program seeks to balance the needs and demands of resource utilization with environmental quality and sustainability.

2. Scope of the Program

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

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

1. Assumptions made for the Program

That researchers and Extension educators will be able to convince growers that "less is more" in that decreasing the use of fertilizers and pesticides can result in lower costs as well as the beneficial effect of having a smaller quantity of these chemicals in the neighboring environment, that rapidly-growing niche markets such as organic farming are in desperate need of science-based information in areas such as sustainability, and that even in an ever-increasingly competitive environment stakeholders will continue to see the importance of protecting and best utilizing our natural resources.

2. Ultimate goal(s) of this Program

Ensuring environmental friendliness and resource utilization efficiency, best utilizing insect management in agricultural cropping systems, and minimizing agricultural impacts on the environment. Citizens will become involved in the preservation of natural resources through forest, prairie, watershed, and wildlife management by applying research-based knowledge.

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	12.4	0.0	16.0	0.0
2010	12.4	0.0	16.0	0.0
2011	12.4	0.0	16.0	0.0
2012	12.4	0.0	16.0	0.0
2013	12.4	0.0	16.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research has focused on developing, improving, and evaluating watershed models and other approaches for TMDL development and implementation, GPS as-applied mapping as a cost effective method of improving manure application accountability, recordkeeping, and accurate nutrient utilization, enhancing commercial production of floriculture crops by identifying plants that tolerate or negatively impact insect populations, a study of dispersal and disease transmission by rotation-resistant western corn rootworm, and a study of the link between microbial community composition and denitrification in natural, restored, and constructed wetlands.

Extension activities will include statewide tillage seminars, soil and water workshops, conservation days [for youth], natural resource management online courses for Certified Crop Advisors, and pond management seminars and demonstrations. Extension will continue to play a lead role in the Governor's Biennial Conference on the Management of the Illinois River System. New activities for the year will include the release of a website addressing human/wildlife interactions and the expansion of the Master Naturalist program. The Master Naturalist program will provide science-based educational opportunities that connect people with nature and help them become engaged environmental stewards. The program will address the need for environmental sustainability and stewardship in a state that is undergoing increasing urbanization, changing demographics, shifting land use, and undergoing a decline in outdoor recreational and educational activity use.

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 ● Workshop ● Other 1 (On-line course) ● Other 2 (Volunteer training) ● Education Class ● Demonstrations 	<ul style="list-style-type: none"> ● TV Media Programs ● Web sites ● Newsletters

3. Description of targeted audience

Members of the target audience include environmental professionals in pollution management, scientists who examine and teach about healthy fresh water systems, land managers and farmers who manage landscapes that have an impact on fresh water, recreational fishermen, producers, crop consultants, Extension educators, greenhouse managers, organic growers and growers interested in sustainable farming practices, land improvement contractors, certified crop advisers, farmers, drainage

contractors, state and federal agency staff, livestock producers, livestock commodity groups, environmental regulatory agencies, and citizens who have a strong interest and desire to volunteer to preserve and showcase natural resources.

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	9800	170	10000	0
2010	9600	160	10000	0
2011	9000	160	10000	0
2012	9000	160	10000	0
2013	9000	160	10000	0

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

Expected Patent Applications

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

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	40	1	41
2010	40	2	42
2011	40	2	42
2012	40	1	41
2013	40	1	41

V(H). State Defined Outputs

1. Output Target

- Number Of Completed Hatch Projects

2009 :7 2010 :7 2011 :7 2012 :7 2013 :7

- Continuing Education Units Awarded To Certified Crop Advisers Who Complete Online Natural Resource Management Courses

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

V(I). State Defined Outcome

O. No	Outcome Name
1	Number Of Drainage Water Management System Acres
2	Reduction Of Nitrate Levels In Lake Bloomington, Illinois, A Largely Agricultural Watershed [Assuming A 100% Baseline For 2008]
3	Application Of Reduced Tillage Or Soil And Water Management Practices

Outcome #1

1. Outcome Target

Number Of Drainage Water Management System Acres

2. Outcome Type : Change in Knowledge Outcome Measure

2009 :1200 **2010** : 2000 **2011** : 2800 **2012** 3600 **2013** :4500

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 405 - Drainage and Irrigation Systems and Facilities

Outcome #2

1. Outcome Target

Reduction Of Nitrate Levels In Lake Bloomington, Illinois, A Largely Agricultural Watershed [Assuming A 100% Baseline For 2008]

2. Outcome Type : Change in Condition Outcome Measure

2009 95 **2010** : 90 **2011** : 70 **2012** 60 **2013** :60

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation

Outcome #3

1. Outcome Target

Application Of Reduced Tillage Or Soil And Water Management Practices

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

4. Associated Knowledge Area(s)

- 102 - Soil, Plant, Water, Nutrient Relationships
- 112 - Watershed Protection and Management
- 133 - Pollution Prevention and Mitigation

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

External factors include concerns at the global [events that have an impact on the environment as a whole such as current concerns about greenhouse emissions], federal and state [most importantly revolving around governmental policy decisions and the availability of resources], and local [that owners of natural resources are wise stewards not only of their own resources but of the impact their actions have on the community] levels.

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

1. Evaluation Studies Planned

- During (during program)
- After Only (post program)
- Retrospective (post program)

Description

Statewide studies have not yet been identified. Evaluation of the format and content of individual Extension programs will likely be continued. Formative evaluation plans are being developed for the new Master Naturalist program with impact evaluations to be designed for the future.

2. Data Collection Methods

- Mail
- Whole population
- On-Site

Description

These represent the traditional methods that have been used in the past and are assumed to be ones of choice in the future.

V(A). Planned Program (Summary)

Program #5

1. Name of the Planned Program

Human Nutrition, Diet Adequacy, Health and Wellbeing

2. Brief summary about Planned Program

There are strong interrelationships among diet, activity level, and health. Research seeks to further understand these interrelationships while improving the quality of food and food choices. Since research in isolation is of little value in improving an individual's health, Extension seeks to help consumers improve the quality of their diets through improved food choices.

Consumers must choose from a wide variety of food products each day and be discerning judges of nutrition information. Extension programs focus on general nutrition and food buying with limited resource families and youth as a key target audience, diet and disease, and physical exercise. Live Well, Be Well is a new applied research and Extension program that will be launched to achieve the adoption, implementation, and evaluation of an enhanced evidence-based chronic disease self-management program for adults with chronic illness in traditionally underserved areas.

Sources of funding for the College's research agenda in food and nutrition come from a variety of sources including Hatch funding. These efforts cover a wide range of topics. Two examples include the effects of dietary phytoestrogen on aging, breast cancer progression, obesity, risk of diabetes, and cognitive function, and the development of sustainable solutions for improving the diet of populations affected by prolonged undernourishment, malnourishment, and devastating chronic diseases.

The formal interrelation between Extension and the College's research efforts in human nutrition is provided through Extension's Nutrition and Wellness Team. This team includes faculty members from the Department of Food Science and Human Nutrition. In addition to jointly planning programs, the Extension team and faculty collaborate on joint research projects.

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 : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
604	Marketing and Distribution Practices	0%		10%	
702	Requirements and Function of Nutrients and Other Food Components	0%		25%	
703	Nutrition Education and Behavior	50%		20%	
704	Nutrition and Hunger in the Population	10%		20%	
723	Hazards to Human Health and Safety	0%		10%	
724	Healthy Lifestyle	40%		15%	
	Total	100%		100%	

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

1. Situation and priorities

The research agenda of the College and the focus of Extension programming are heavily influenced by multiple stakeholder groups. Much of the focus is captured by the goals expressed by the Illinois Council on Food and Agricultural Research (C-FAR) for research and outreach:

- Investigate relevant nutrition-related public health issues, for example: "metabolic syndrome" [obesity, cardiovascular disease, and diabetes], cancer, and specific age-related issues
- Develop sustainable solutions for nutrition-deficient populations
- Investigate issues related to nutrition and wellness and develop effective methods of communicating this information

According to 2007 data from the National Institute of Health, over 20 million people in the U.S. have diabetes, and data from the Illinois Department of Public Health indicates that more than 700,000 Illinois residents have been diagnosed. Diabetes puts these individuals at greater risk for complications such as amputation, blindness, and even death. Likewise, according to the national Osteoporosis Foundation, osteoporosis and low bone mass are major health threats for those over age 50. In addition, individuals and families with limited resources often lack adequate food, make poor food choices, and lack skills in food budgeting. Obesity is a well-recognized problem for individuals of all ages and backgrounds that leads to increased risk for many diseases.

Nutrition and healthy lifestyle education for diabetics or primary caretakers is a high priority for Extension programming. Extension programs also focus on the challenges that limited resource audiences face with respect to wise food choices, food buying, and health related information.

2. Scope of the Program

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

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

1. Assumptions made for the Program

That researchers in the Department of Food Science and Human Nutrition and the Division of Nutritional Sciences will have the resources available to continue to develop food products that have improved nutritional value and a high level of consumer acceptance while also being widely available and affordable. Extension will continue to serve this mission by working throughout the state to educate citizens on the importance of making smart food choices through programs such as "Dining with Diabetes."

2. Ultimate goal(s) of this Program

To determine the effects of dietary and environmental factors on human health and disease. That individuals will make smart food choices, engage in recommended levels of physical exercise, and choose leisure activities that help them maintain desirable weight levels and better manage chronic diseases.

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	45.4	0.0	7.0	0.0
2010	45.4	0.0	7.0	0.0
2011	45.4	0.0	7.0	0.0
2012	45.4	0.0	7.0	0.0
2013	45.4	0.0	7.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Activities include the study of genistein [the principal soy isoflavone] in relation to estrogen-related breast cancer treatment, developing low-cost methods to increase protein in the diets of people in developing countries, identifying feasible strategies to treat gastrointestinal failure, investigating the importance of calcium on osteoporosis prevention, examining the health-promoting properties of broccoli, and understanding the mechanisms of fat deposition/mobilization on obesity.

Extension activities will address diet planning, food selection, cooking methods, and exercise with respect to maintaining health and mitigating the effect of such diseases as diabetes and osteoporosis. Special activities to promote physical activity and mitigate disease transmission will also be addressed. Live Well, Be Well is a new applied research and Extension program that will be launched to achieve the adoption, implementation, and evaluation of an enhanced evidence-based chronic disease self-management program for adults with chronic illness in traditionally underserved areas.

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"> ● Education Class ● Workshop ● Demonstrations ● One-on-One Intervention 	<ul style="list-style-type: none"> ● Web sites ● Newsletters

- Group Discussion

3. Description of targeted audience

The target audience includes youth, limited resource individuals and families, individuals with diabetes and their caretakers, and the elderly. Other specific audiences include infants suffering from rotovirus infection, adults with a targeted college-age and older adult audience in an effort to validate calcium intake, and researchers and educators in nutrition and functional foods.

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	500000	100000	400000	0
2010	500000	100000	400000	0
2011	500000	100000	400000	0
2012	500000	100000	400000	0
2013	500000	100000	400000	0

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

Expected Patent Applications

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

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	15	1	16
2010	15	1	16
2011	15	1	16
2012	15	1	16
2013	15	1	16

V(H). State Defined Outputs

1. Output Target

- Number Of Completed Hatch Projects

2009 5 2010 5 2011 :5 2012 5 2013 5

V(I). State Defined Outcome

O. No	Outcome Name
1	Self-Reported Increase In Knowledge Of Types Of Foods That Affect Blood Glucose Levels
2	Planning Appropriate Meals For Diabetics

Outcome #1

1. Outcome Target

Self-Reported Increase In Knowledge Of Types Of Foods That Affect Blood Glucose Levels

2. Outcome Type : Change in Knowledge Outcome Measure

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

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 704 - Nutrition and Hunger in the Population
- 724 - Healthy Lifestyle

Outcome #2

1. Outcome Target

Planning Appropriate Meals For Diabetics

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

4. Associated Knowledge Area(s)

- 703 - Nutrition Education and Behavior
- 724 - Healthy Lifestyle

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

External Factors include impacts on the production process [the most obvious being significant weather changes that can affect farm production], factors that can affect consumer confidence in food products [such as the 143 million pound beef recall that occurred in February of 2008], lifestyle changes [our hectic lifestyle has pushed many consumers toward choosing convenience over nutrition], and as always, the availability of resources needed to conduct research and outreach.

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

1. Evaluation Studies Planned

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

Description

Pre and post test questionnaires are annually completed with participants in the Dining with Diabetes class series. An online quiz that is a part of the joint research and Extension diabetes website will continue to collect data. This coming year an evaluation will be conducted to assess the impact of the diabetes Spanish website version, the teen website, and the soy in diabetes data.

2. Data Collection Methods

- Sampling
- Tests
- Whole population
- On-Site
- Other (Survey On Information Web Site)
- Mail

Description

The Diabetes website includes a quiz as part of the online modules. Participants in selected face-to-face programs complete a pre/post evaluation.

V(A). Planned Program (Summary)

Program #6

1. Name of the Planned Program

Food Product Development, Processing and Safety

2. Brief summary about Planned Program

Leadership for food product development rests with the College of Agricultural, Consumer and Environmental Sciences [ACES] Department of Food Science and Human Nutrition. The College also hosts the National Soybean Research Laboratory which houses the Illinois Center for Soy Foods. The Center has among its interests the study of the efficacy and safety of soy food products to improve human health. Additional research interests in the department include improving the safety of food processing techniques while improving the nutritional quality of food products.

Strongly related to food product development is the overriding issue of food safety. Food safety is an issue for all families regardless of household resource level and affects producers, processors, establishments serving food to the public, and consumers. Concerns regarding food safety have been expressed by a number of stakeholders including the Illinois Council on Food and Agricultural Research [C-FAR] as well as local Extension advisory councils and other stakeholders.

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 : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	0%		35%	
502	New and Improved Food Products	0%		30%	
503	Quality Maintenance in Storing and Marketing Food Products	20%		10%	
702	Requirements and Function of Nutrients and Other Food Components	0%		15%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	80%		10%	
	Total	100%		100%	

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

1. Situation and priorities

According to the Center for Disease Control [CDC] an estimated 76 million cases of foodborne disease occur each year in the United States. Generally these cases are mild and cause symptoms for only a day or two. Some cases are more serious, and CDC estimates that there are 325,000 hospitalizations and 5,000 deaths related to foodborne diseases each year. Even mild

cases may have economic losses associated with absence from work. Estimates are that a single outbreak of foodborne illness can cost a restaurant or other food service facility a minimum of \$75,000. As of October 1, 1999, the Food Service Sanitation Code required Illinois certified food service sanitation managers to attend food safety training with a minimum of five hours or to complete a re-certification exam to be eligible for re-certification. The problem: Improper food handling techniques are a primary cause of foodborne illnesses.

Our research covers a wide range of topics from food safety and biotechnology to clinical nutrition and toxicology. Outside research funding comes from a variety of sources such as the National Institutes of Health, Illinois Corn Marketing Board, Illinois Council for Food and Agricultural Research, Mitsubishi Chemical, Illinois Soybean Association, United Soybean Board, and Kraft Foods.

2. Scope of the Program

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

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

1. Assumptions made for the Program

We assume that the causes of foodborne illnesses and pathogens are well understood, that foodborne illnesses are best controlled through an analysis of how food is handled to avoid contamination and pathogen growth, and that additional safety can be assured in what foods are selected for use. We also assume that new methods of food product development will be able to balance the competing needs of improving food safety, improving processing efficiency, lowering costs, making products more widely available, and maintaining a high level of consumer acceptance.

2. Ultimate goal(s) of this Program

To develop safe food products and processing techniques for food preparation, storage and use by the food processing industry, households, and consumers. To increase the use of safe food handling practices by households, consumers [adults and youth], and establishments that prepare food for public consumption.

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	2.1	0.0	6.0	0.0
2010	2.1	0.0	6.0	0.0
2011	2.1	0.0	6.0	0.0
2012	2.1	0.0	6.0	0.0
2013	2.1	0.0	6.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Extension activities include workshops, web site postings and presentations that focus on safe food handling in homes, commercial entities, and public settings. Research activities include an investigation of acoustic energy as a practical food safety intervention for fruit and vegetable juice processing, studying the effects of bioactive dietary chemicals on human health and food safety, research on the applications of edible films and coatings, an analysis of aroma-active components of foods, a study

of pre-treatment effects on color of irradiated beef and pork, and work to improve barrier properties of biobased packaging films.

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"> ● Education Class ● One-on-One Intervention ● Workshop 	<ul style="list-style-type: none"> ● Web sites ● Newsletters

3. Description of targeted audience

Nutritionists and food scientists, soy processors, food manufacturers ranging from ingredient providers to packaging operations, food industry professionals including employees of establishments that prepare food for public consumption, regulatory agencies, and food microbiologists.

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	3000	2000	3500	0
2010	3000	2000	3500	0
2011	3000	2000	3500	0
2012	3000	2000	3500	0
2013	3000	2000	3500	0

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

Expected Patent Applications

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

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	25	1	26
2010	25	1	26
2011	25	1	26
2012	25	1	26
2013	25	1	26

V(H). State Defined Outputs

1. Output Target

- Number Of Completed Hatch Projects

2009 3

2010 3

2011 3

2012 3

2013 3

V(I). State Defined Outcome

O. No	Outcome Name
1	Percent Increase In The Use Of Biodegradable Packaging Materials Throughout The Food Industry
2	Completion Of A Food Safety Sanitation Refresher Course And Recertification Exam By Employees Of Establishments That Prepare Food For Public Consumption
3	Program Participants Self-Report Cooking And Reheating Protein Food To Correct Temperatures

Outcome #1

1. Outcome Target

Percent Increase In The Use Of Biodegradable Packaging Materials Throughout The Food Industry

2. Outcome Type : Change in Action Outcome Measure

2009 :10 **2010** : 15 **2011** : 20 **2012** 25 **2013** :30

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 502 - New and Improved Food Products

Outcome #2

1. Outcome Target

Completion Of A Food Safety Sanitation Refresher Course And Recertification Exam By Employees Of Establishments That Prepare Food For Public Consumption

2. Outcome Type : Change in Knowledge Outcome Measure

2009 #00 **2010** : 400 **2011** : 400 **2012** #00 **2013** :400

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 503 - Quality Maintenance in Storing and Marketing Food Products
- 712 - Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Target

Program Participants Self-Report Cooking And Reheating Protein Food To Correct Temperatures

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

4. Associated Knowledge Area(s)

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

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Natural disasters may influence the availability of facilities for safely developing, storing, distributing, and using food products. The changes in the economy and appropriation changes may influence the resources available for research/Extension programs. Government regulations may influence food product development and processing. Competing priorities [public and programmatic] may influence the level of programmatic effort from non-subject matter staff such as CountyDirectors.

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

1. Evaluation Studies Planned

- Other (Sensory Panels)
- After Only (post program)
- Retrospective (post program)

Description

A follow-up survey with Extension Food Safety Sanitation Refresher Course participants will be replicated from previous years. The survey will seek their identification of practice changes [from a list provided] that they have implemented at the food service establishments where they work.

2. Data Collection Methods

- Observation
- Whole population
- Tests
- Mail
- Sampling

Description

Data collection methods include sensory panels. The previous survey of practices of Food Safety Sanitation Refresher Course participants was sent via mail this time but in the future we may use an online survey. The survey was sent to all participants, but we may choose a random sample in the coming year.

V(A). Planned Program (Summary)

Program #7

1. Name of the Planned Program

Agricultural and Consumer Economics

2. Brief summary about Planned Program

The Department of Agricultural and Consumer Economics targets research and outreach programs aimed at improving the economic and environmental well-being of producers, consumers, and families. Drawing on economics, business, and law, the department analyzes issues related to individuals and families, agriculture and natural resources, and food -- all ranging in scope from local to global. Researchers in the department partner with two Extension program teams, the Farm Business Management and Marketing Team and the Consumer and Family Economics Team. Team members work with local Extension councils and stakeholders as well as research faculty in identifying needs and establishing programs to meet those needs. These interactions in turn influence the research agenda of the College.

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 : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
602	Business Management, Finance, and Taxation	35%		40%	
603	Market Economics	0%		15%	
605	Natural Resource and Environmental Economics	0%		15%	
607	Consumer Economics	0%		10%	
610	Domestic Policy Analysis	0%		10%	
801	Individual and Family Resource Management	65%		10%	
	Total	100%		100%	

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

1. Situation and priorities

Agricultural producers, including those engaged in horticulture businesses, express concerns about their enterprise's sustainability and profitability and about how to manage changes with competing demands for limited resources. Illinois

consumers face issues that involve identity theft, credit debt load, health care options, planning for retirement, affordable housing, and managing to maintain the desired quality of life on fixed and/or limited incomes.

2. Scope of the Program

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

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

1. Assumptions made for the Program

That international developments in agricultural law have an increasing impact on the legal situation in the United States, that farmers lack the information to best utilize crop yield and revenue insurance products, that many current environmental economic tools are simplistic and could provide better insight to policy makers if they were enriched by considering special issues [such as paying closer attention to heterogeneity of land, consumers, and producers], and that resources will continue to be available to allow agricultural economists at Illinois to continue to provide thoroughly researched policy advice to policy makers and producers at both the local and national levels.

2. Ultimate goal(s) of this Program

To inform and improve decisions related to Midwest commercial food and agricultural sectors involving production, financing, marketing, and risk management, to identify and estimate the impact of federal and state policies on rural communities, agricultural producers, and society, to help inform the policy making process, to describe and measure the well being of individual consumers, families, and communities resulting from changes in economic and regulatory conditions, and to improve the financial condition of individuals and families, particularly those with high debt loads or diminishing income.

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	7.0	0.0	22.0	0.0
2010	7.0	0.0	22.0	0.0
2011	7.0	0.0	22.0	0.0
2012	7.0	0.0	22.0	0.0
2013	7.0	0.0	22.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research activities include a cost/benefit analysis of natural resource policies [such as the impact of contaminated rivers in Wisconsin and New York on local property values], a study of the function and performance of rural finance markets, and an investigation of the variety selection process followed by Illinois soybean producers. Activities also include an analysis of the legal issues affecting agriculture, a study of agricultural and rural financial markets, research on the management of grain quality and security for world markets, an evaluation of risk management alternatives for Illinois farmers, and research on regulatory impacts on small public water supply systems.

Extension activities encompass farm financial management including risk management, personal financial management, consumer health care options, housing decisions with respect to purchase and financing, and planning ahead for retirement.

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"> ● Group Discussion ● Workshop ● Education Class ● Other 1 (Audio/Video Conferencing) ● One-on-One Intervention 	<ul style="list-style-type: none"> ● TV Media Programs ● Newsletters ● Web sites

3. Description of targeted audience

Producers at both the local and national levels, practicing lawyers and academic lawyers, farmers, processors, retail distributors of natural and organic products, agriculture biotechnology firms, farm credit institutions, prospective and current homeowners, consumers who have filed for bankruptcy, agribusinesses, policy makers, environmental economists, applied econometricians, public officials in the Great Lakes areas, real estate developers and builders, community planning and building officials, managers of small public water supply systems, and conservation groups.

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	12000	20000	2500	0
2010	12000	20000	2500	0
2011	12000	20000	2500	0
2012	12000	20000	2500	0
2013	12000	20000	2500	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	45	2	47
2010	45	2	47
2011	45	2	47
2012	45	2	47
2013	45	2	47

V(H). State Defined Outputs

1. Output Target

- Number Of Completed Hatch Projects

2009 2

2010 2

2011 2

2012 2

2013 2

V(I). State Defined Outcome

O. No	Outcome Name
1	Page File Requests Made To Farmdoc
2	Successful Completion Of The Home Buying Process
3	Knowledge Of Practices That Affect Your Credit Rating
4	Knowledge Of Planning For The Expenses Of Home Ownership
5	Aspiration To Compare Prices And Review Bills More Carefully

Outcome #1

1. Outcome Target

Page File Requests Made To Farmdoc

2. Outcome Type : Change in Knowledge Outcome Measure

2009 :195000 **2010 :** 200000 **2011 :** 205000 **2012 :** 205000 **2013 :** 210000

3. Associated Institute Type(s)

- 1862 Extension
- 1862 Research

4. Associated Knowledge Area(s)

- 602 - Business Management, Finance, and Taxation

Outcome #2

1. Outcome Target

Successful Completion Of The Home Buying Process

2. Outcome Type : Change in Action Outcome Measure

2009 :50 **2010 :** 50 **2011 :** 50 **2012 :** 50 **2013 :** 50

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

Outcome #3

1. Outcome Target

Knowledge Of Practices That Affect Your Credit Rating

2. Outcome Type : Change in Knowledge Outcome Measure

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

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

Outcome #4

1. Outcome Target

Knowledge Of Planning For The Expenses Of Home Ownership

2. Outcome Type : Change in Knowledge Outcome Measure

2009 :50 **2010 :** 50 **2011 :** 50 **2012 :** 50 **2013 :** 50

3. Associated Institute Type(s)

- 1862 Extension

4. Associated Knowledge Area(s)

- 801 - Individual and Family Resource Management

Outcome #5

1. Outcome Target

Aspiration To Compare Prices And Review Bills More Carefully

2. Outcome Type : Change in Knowledge Outcome Measure

2009 :100

2010 : 100

2011 : 100

2012 :100

2013 :100

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

- Government Regulations
- Economy

Description

Changes in legislation, changes in state and national economic variables such as employment, interest rates, and availability of capital, and challenges faced in the emerging private research and development sectors in developing countries.

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

1. Evaluation Studies Planned

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

Description

Some evaluation studies of existing program efforts have already been completed. Additional studies will be undertaken to document outcomes of those program efforts where studies have not been completed.

2. Data Collection Methods

- On-Site
- Mail
- Whole population

Description

Pre and post tests have been designed and will continue to be used with required classes for those who have declared personal bankruptcy. A post program evaluation exists and will be used to evaluate home buying programs. Data will be collected from HUD regarding home purchases by limited resource audiences.

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

Biofuels

2. Brief summary about Planned Program

The United States is the largest user of energy in the world accounting for about 50% of total consumption. Thus, any change in global energy use will require a change in production and consumption of energy in the U.S. The major renewable energy systems include solar, wind, biomass, hydroelectric, and geothermal. Biofuels have been gaining ground since the 1980's, but several limitations need to be overcome before plant/crop based resources and processes become a viable alternative to petrochemical-based systems for chemicals and energy. These include improvements in the efficiency of bioconversion of plant fibers to value added products and extraction of high value products.

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 : Yes

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	60%		60%	
402	Engineering Systems and Equipment	25%		25%	
601	Economics of Agricultural Production and Farm Management	15%		15%	
	Total	100%		100%	

V(C). Planned Program (Situation and Scope)**1. Situation and priorities**

Biobased renewable resources can be obtained from a wide range of agricultural crops, forestry products, and processing industries. The U.S. has access to significant amounts of biobased resources, including those of the highly productive corn/soybean cropping system in the central U.S., arguably the largest man-made ecosystem on the planet. This agro-ecosystem is still largely focused on providing raw materials for the food, feed, and fiber industries and not on chemicals and fuels, which is the focus of this thematic program.

2. Scope of the Program

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

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

There already exists growing support for biofuels as evidenced by the marketing of biodiesel blends in many states, and the provision of tax incentives for its use. We assume that this trend will continue and funding will be available to allow us to take advantage of this trend.

2. Ultimate goal(s) of this Program

The U.S. government has committed the nation to an ambitious plan to triple the use of biobased materials and bioenergy by 2010. As a member of the Midwest Consortium for Biobased Products and Bioenergy, the University of Illinois is committed to working regionally to help meet this goal. Specific goals include providing fuel and materials for sustainability, improving biofuel production and carbon sequestration, and developing a research base that will allow for the development of management systems that efficiently and economically produce bioenergy crops.

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	2.0	0.0	3.0	0.0
2010	3.0	0.0	3.0	0.0
2011	4.0	0.0	3.0	0.0
2012	4.0	0.0	3.0	0.0
2013	4.0	0.0	3.0	0.0

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

We will combine and focus the specialized research abilities of faculty members from several disciplines to generate chemicals and biofuels from renewable biomass sources using a comparative and functional genomic approach. Future economic development aspects include technology transfer, biotech startups, attraction of national talents including faculty, students and postdoctoral associates, and training of a first-class workforce. Research is also focusing on perennial rhizomatous grasses, such as switchgrass and Miscanthus, which are particularly well-suited as bioenergy crops. Work is also being conducted to evaluate the impact of biofuels on emissions reducing technologies for off-road diesel engines.

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"> ● Demonstrations ● Workshop 	<ul style="list-style-type: none"> ● Web sites ● Newsletters ● TV Media Programs

3. Description of targeted audience

The beneficiaries of this research will be agriculture and agriculture-based industries in Illinois, although ultimately all of us will benefit as consumers of energy.

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	0	0
2010	500	0	0	0
2011	500	0	0	0
2012	500	0	0	0
2013	500	0	0	0

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

Expected Patent Applications

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

3. Expected Peer Review Publications

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

V(H). State Defined Outputs

1. Output Target

- Number Of Completed Hatch Projects

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

V(I). State Defined Outcome

O. No	Outcome Name
1	Proportion Of The Use Of Biomass Relative To Total Energy [Currently At 3-4%]
2	Percent Reduction In NOx Emissions From Biodiesel
3	Improvement In The Biomass Yields Of Perennial Grasses For Cellulosic Ethanol Relative To Current Maximum Switchgrass Yields

Outcome #1

1. Outcome Target

Proportion Of The Use Of Biomass Relative To Total Energy [Currently At 3-4%]

2. Outcome Type : Change in Condition Outcome Measure

2009 : 8 **2010 :** 10 **2011 :** 12 **2012 :** 13 **2013 :** 14

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms
- 402 - Engineering Systems and Equipment
- 601 - Economics of Agricultural Production and Farm Management

Outcome #2

1. Outcome Target

Percent Reduction In NOx Emissions From Biodiesel

2. Outcome Type : Change in Condition Outcome Measure

2009 : 50 **2010 :** 60 **2011 :** 65 **2012 :** 65 **2013 :** 65

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment

Outcome #3

1. Outcome Target

Improvement In The Biomass Yields Of Perennial Grasses For Cellulosic Ethanol Relative To Current Maximum Switchgrass Yields

2. Outcome Type : Change in Condition Outcome Measure

2009 : 50 **2010 :** 70 **2011 :** 90 **2012 :** 95 **2013 :** 100

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 201 - Plant Genome, Genetics, and Genetic Mechanisms

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Concerns both environmental [global warming] and economic [high energy prices] will drive the demand for biofuels research. Improvements in crop productivity and the utilization of bioenergy will also continue to be important external factors.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- During (during program)

Description

Planned evaluation studies included ongoing tests to measure our ability to use biodiesel fuel and exhaust gas recirculation to reduce NOx emissions and side-by-side trials conducted on prime agricultural land to compare the productivity of Miscanthus versus switchgrass.

2. Data Collection Methods

- Sampling
- Tests
- Observation

Description

Data collection methods included engine tests, combustion simulations, and field trials.

V(A). Planned Program (Summary)

Program #9

1. Name of the Planned Program

Human Development and Family Wellbeing

2. Brief summary about Planned Program

The stresses on American families are well known. Although rates of divorce have stabilized in the last 20 years, 40 to 50 percent of all first marriages end in divorce. The number of children growing up in poverty is a breathtaking 16.2 percent. The number of adults raising children while also caring for an aging parent has grown, and rates of children diagnosed with attentional, learning, and behavioral problems have soared, particularly as we have become more skilled in recognizing these problems.

Still, there is compelling evidence that many families—including those living under difficult circumstances—manage to raise their children successfully and support their members. Because family strengths tend to be difficult to quantify, they can easily be overlooked or dismissed as unimportant. The result is a significant gap in our knowledge base. We need to know from research the factors that make for strong families.

Within the Department of Human and Community Development in the College of ACES is the Pampered Chef Family Resiliency Program [www.familyresiliency.uiuc.edu]. Established in 2000, the program is dedicated to enriching child, individual, and family well-being in the context of communities. The program supports innovative research, education, and public engagement outreach activities that hold potential for strengthening families' ability to be resilient in the face of life stressors and to successfully navigate the competing demands of work and family. The center focuses activities around three themes: positive human development, family wellness, and strengthening family and community connections. Ongoing Extension programs address family issues at all stages of the life cycle from infancy through issues of aging and care of dependent adults.

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 : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
802	Human Development and Family Well-Being	100%		100%	
	Total	100%		100%	

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

1. Situation and priorities

As noted in the overview, what determines positive family outcomes is not always easily predictable. The ongoing research being conducted is attempting to determine how family resiliency can be enhanced. Aging Americans and their families are faced with shifting roles in care-giving and relationships within the family. Balancing work and family often brings increased stress, fatigue, illness, and strained relationships. In addition, teens find establishing and maintaining healthy relationships with their peers and the opposite sex to be challenging and stressful. Parenting can become overwhelming, often resulting in child abuse or an environment that is not supportive of the healthy development of youth because parents lack knowledge and skills regarding best parenting practices. In addition, grandparents who are caring for grandchildren are struggling to cope with complex changes that affect lifestyles, employment, and family relations.

2. Scope of the Program

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

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

1. Assumptions made for the Program

That resource levels will remain stable for family research and educational programming. That our current understanding of the complex relationships involved among family members is sufficient to provide research based educational programming.

2. Ultimate goal(s) of this Program

Researchers are studying the factors that enhance or hinder resilience in families in order to create programs and policies that will foster healthy families. Researchers are also studying the processes of positive social and emotional development in children and adolescents in order to develop ways in which parents and other adults can foster healthy development. Through Extension programs, families will thrive through establishing healthy relationships, understanding children's development and how to foster it, and coping with the challenges of aging and intergenerational issues.

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	16.6	0.0	8.0	0.0
2010	16.6	0.0	8.0	0.0
2011	16.6	0.0	8.0	0.0
2012	16.6	0.0	8.0	0.0
2013	16.6	0.0	8.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Extension activities will focus on aging and intergenerational issues including care-giving roles and coping strategies, family and individual resiliency including balancing work and family life and handling various life crises, developing healthy relationships, and building parenting skills for specific ages of children. Delivery methods will include maintenance and expansion of the Parenting 24/7 website, fact sheets and brochures such as the Your Young Child series, workshops including those on caregiving relations and managing the challenges of contemporary working life [Intentional Harmony curriculum], video/dvd's, and newsletters including Parenting Again [for grandparents raising grandchildren].

Research activities include a longitudinal study designed to help couples manage work and family life while maintaining intimacy and keeping conflicts constructive, a preventive intervention program [More Fun With Brothers and Sisters] designed to increase pro-social sibling relationships, expansion of the Child Development Laboratory Research Database, work with parents to identify those with the potential for safe and effective co-parenting after divorce despite a history of violence, an effort to identify chronic stressors in the lives of low-income, African American families living in low-resource, high-risk neighborhoods and the coping strategies used to address these stressors, and an effort to assess the strengths and needs of gay/lesbian parents and their children in downstate Illinois.

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"> ● Group Discussion ● Other 1 (DVD's) ● Education Class ● One-on-One Intervention ● Workshop 	<ul style="list-style-type: none"> ● Public Service Announcement ● Other 1 (Train The Trainer) ● TV Media Programs ● Web sites ● Newsletters

3. Description of targeted audience

Target audiences include working couples, families with children age four to eight, researchers, developers of intervention programs, family life counselors, domestic violence advocates, gay and lesbian parents and children, teachers and community outreach education programs that promote the well-being of children and families, and African-American families living in low-income and high-risk neighborhoods. Additional Extension target audiences include grandparents raising grandchildren, elder caregivers, teens, child care providers, and parents of various targeted-age groups of children.

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	14700	20000	2100	0
2010	14700	20000	2100	0
2011	14700	20000	2100	0
2012	14700	20000	2100	0
2013	14700	20000	2100	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	7	1	8
2010	9	1	10
2011	9	1	10
2012	9	1	10
2013	9	1	10

V(H). State Defined Outputs

1. Output Target

- Number Of Completed Hatch Projects

2009 :1

2010 :1

2011 :1

2012 :1

2013 :1

V(I). State Defined Outcome

O. No	Outcome Name
1	Number Of Research Projects Utilizing The Child Development Laboratory Research Database
2	Increased Knowledge Of Children's Behavior At A Given Stage Of Development And Parenting Practices To Foster That Behavior
3	Reduction In Physical And Emotional Strain In Handling The Challenges Of Work And Family

Outcome #1

1. Outcome Target

Number Of Research Projects Utilizing The Child Development Laboratory Research Database

2. Outcome Type : Change in Knowledge Outcome Measure

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

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

Outcome #2

1. Outcome Target

Increased Knowledge Of Children's Behavior At A Given Stage Of Development And Parenting Practices To Foster That Behavior

2. Outcome Type : Change in Knowledge Outcome Measure

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

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

Outcome #3

1. Outcome Target

Reduction In Physical And Emotional Strain In Handling The Challenges Of Work And Family

2. Outcome Type : Change in Action Outcome Measure

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

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 802 - Human Development and Family Well-Being

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Any significant trend that affects the family, including changes in divorce rates, parents delaying having children until later in life [or on the opposite side an increase in teen pregnancy], a downturn in the economy [or other forms of economic hardships], and continued migration from rural to urban areas.

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

1. Evaluation Studies Planned

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

Description

Evaluation of Intentional Harmony curriculum and workshops will continue as will data gathered for Parenting 24/7.

2. Data Collection Methods

- On-Site
- Other (On-line evaluations)
- Observation
- Sampling
- Whole population
- Mail

Description

Data collection methods include pre-test and post-test, face-to-face interviews, participant observation, photo elicitation, family interviews, questionnaires, and workshop participant surveys. Groups studied will include divorced mothers who are victims of domestic violence, African Americans living in high-risk neighborhoods, and families with young children.

V(A). Planned Program (Summary)

Program #10

1. Name of the Planned Program

4-H Youth Development

2. Brief summary about Planned Program

Youth development programs are designed to allow youth and adults to work together in family and community environments to create real life learning laboratories that help youth practice skills they need today and will continue to need for the rest of their lives, to reach youth in their own neighborhoods and communities with unique, hands-on learning strategies suited to their needs, to address current youth issues through positive prevention programs, and to promote positive youth/adult partnerships involving them in significant decision making and encouraging their participation in community roles.

Although state funding for 4-H Youth Development staff has experienced severe cuts, funding at the local level demonstrates a significant resource commitment in Illinois to serving the needs of youth in rural and urban areas. These investments in youth through informal education are expected to continue to return significant benefits to the public while addressing important issues such as science and youth education.

Drawing on research conducted in the College of ACES in nutrition and health, leadership, and youth involvement in groups, as well as the expertise of faculty in the Colleges of Engineering, Medicine, and Education, the University of Illinois Extension 4-H Youth Development program will focus on the three national mission mandates of the National 4-H Program: Science, Engineering, and Technology, Healthy Lifestyles, and Youth in Civic Engagement/Leadership. Character education, enhancing social and emotional learning, and volunteer training will also receive significant attention. Delivery systems will include 4-H community clubs, after school clubs and interest groups, summer career academies, camps, field trips, and online interactive experiences.

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 : Yes

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	10%		0%	
806	Youth Development	90%		0%	
	Total	100%		0%	

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

1. Situation and priorities

National 4-H program leadership has recognized the widely expressed concerns regarding the sedentary lifestyle and related growing obesity problem in both youth and adults, as well as the need for scientists who can address society's problems and the need for building citizen involvement and leadership by preparing and engaging youth at an early age. In response, national 4-H program leadership has issued mission mandates to develop educational responses to these issues.

University of Illinois Extension’s 4-H Youth Development program has accepted these mandates as priorities for educational programming. Although the 4-H Youth Development program has curricula and activities related to each of these three issues/mandates, an increasing investment will be made. In addition, school officials, community leaders, and parents voice concerns over growing disciplinary problems in schools and youth vandalism. All are concerned with raising children who demonstrate good character and develop into contributing and competent adults. These same groups of individuals, especially working parents, face challenges in keeping youth involved in positive after school activities and finding trained caring volunteers and after-school program staff to lead these activities.

2. Scope of the Program

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

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

1. Assumptions made for the Program

That funding exists and that staff and volunteers can be located to expand programs. That faculty expertise from outside the College of ACES as well as corporate and community partners can be recruited to support the development of materials and programs.

2. Ultimate goal(s) of this Program

Youth who are: 1) prepared and interested in pursuing careers in science, engineering, and technology, 2) assuming leadership roles in government or community organizations that focus on community enhancement, and 3) developing lasting habits related to proper nutrition and physical activity. In addition, youth involved in 4-H activities will develop good character and exhibit social and emotional development required of adults who can contribute to society.

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	39.0	0.0	0.0	0.0
2010	39.0	0.0	0.0	0.0
2011	39.0	0.0	0.0	0.0
2012	39.0	0.0	0.0	0.0
2013	39.0	0.0	0.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

In an effort to involve 50,000 new youth in 4-H by 2013, four core areas related to SET are targeted for statewide scale-up. These include: 1) robotics, 2) geospatial technologies and community mapping, 3) sustainable energy, and 4) exploring the Wonders of Science (SET Career Exploration). Specific activities will include SET-focused cable programming, internship experiences for college students, a mobile science laboratory, summer career academies, and digital observatories to connect youth and scientists in collaborative science investigations. In addition to the new Wind as Energy curriculum, a youth community informatics curriculum will be developed and offered through 4-H community clubs, special-interest groups, and after-school groups. Activities such as Health Jam, a multi-session program that focuses on healthy eating and physical activity practices and health careers, as well as the 36 Get Up and Move lesson plans for group meetings are examples of program activities related to Healthy Lifestyle development. Leadership, service learning, and character education will receive continued focus. 4-H Youth Development Extension staff are also involved in interdisciplinary efforts with other Extension staff to assist schools with social and emotional learning and healthy relationships school classroom curricula and activities. Research activities related to youth

development are included in the Human Development and Family Wellbeing Planned Program.

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 ● Other 1 (Camps) ● Education Class ● Other 2 (Fieldtrips) ● Group Discussion 	<ul style="list-style-type: none"> ● Web sites ● TV Media Programs ● Newsletters

3. Description of targeted audience

All youth including special targeting to reach minority youth and female youth, youth leaders (paid and volunteer), teachers, parents, and community members.

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	9200	0	200000	100000
2010	10000	0	170000	100000
2011	10000	0	180000	100000
2012	10000	0	200000	100000
2013	10000	0	250000	100000

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	2	4
2010	2	2	4
2011	2	2	4
2012	2	2	4
2013	2	2	4

V(H). State Defined Outputs

1. Output Target

- New Extension Program Curricula Developed

2009 2

2010 2

2011 2

2012 2

2013 2

V(I). State Defined Outcome

O. No	Outcome Name
1	Increased Knowledge About Science And Health Careers
2	Increased Knowledge Of Strategies To Manage Risk In Planning Events For Youth

Outcome #1

1. Outcome Target

Increased Knowledge About Science And Health Careers

2. Outcome Type : Change in Knowledge Outcome Measure

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

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 806 - Youth Development

Outcome #2

1. Outcome Target

Increased Knowledge Of Strategies To Manage Risk In Planning Events For Youth

2. Outcome Type : Change in Knowledge Outcome Measure

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

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 724 - Healthy Lifestyle
- 806 - Youth Development

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

Loss of state funding for 29 professional positions and subsequent reduction of staff in FY2009 will significantly affect the level of programming and youth involvement. The economy may affect the ability of youth to participate in programs and the rising costs of a college education may affect enrollment and preparation of scientists. A number of other youth-serving organizations and activities compete for time youth have for discretionary out-of-school activities.

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

1. Evaluation Studies Planned

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

Description

The 4-H Youth Development professionals team is completing logic models and will be designing evaluation strategies and

tools in the near future. Currently a number of retrospective and follow-up evaluations have been created and data will continue to be collected through a statewide web site to document changes in volunteer knowledge and practices as a result of training provided through the 4-H program. Evaluation instruments also exist for evaluating Health Jam and Get Up and Move, two statewide programs that address the healthy lifestyle mission mandate.

2. Data Collection Methods

- Whole population
- Mail
- Sampling
- Tests
- Structured
- Observation

Description

Participants in Health Jam complete the School Health Education Evaluation (SHEE) test before and after Health Jam. A series of evaluations also exist and are mailed or given to teachers and leaders to assess their observations of students or club members with respect to behavior changes related to demonstrating the six pillars of character. Statewide volunteer trainers distribute an evaluation after various trainings and mail a postcard follow-up several months later to determine the participants knowledge application in working with youth in the clubs they lead.

V(A). Planned Program (Summary)

Program #11

1. Name of the Planned Program

Agricultural and Biological Engineering

2. Brief summary about Planned Program

Leadership is provided by the Department of Agricultural and Biological Engineering. The department contributes to using engineering in an interdisciplinary manner to solve problems in agricultural, food, and biological systems. The department is organized into four groups:

1. Bioenvironmental Engineering Group

Applying engineering principles to biological systems including air quality, biomass and bioenergy, engine emission control, and animal waste management [see Biofuels Planned Program].

2. Food and Bioprocess Engineering Group

Food and bioprocess engineering is the application of engineering principles to preserve, process, package, and distribute biological materials for human and animal consumption, for biofuels, and for biobased products. For elements related to food and bioprocess engineering see the Food Product Development, Processing and Safety Planned Program.

3. Off-Road Equipment Engineering

The mission of off-road equipment engineering is to provide research-based engineering information relating to off-road equipment, agricultural production, and safety. Faculty, staff, and students in this area specialize in agricultural and construction equipment design and the development of precision agricultural technology for production agriculture.

4. Soil and Water Resources Engineering

Soil and Water Resources Engineering involves the management of soil and water resources and water quality. Among the issues addressed by this group are crop nutrient management and understanding the relationships between land use and water quality and the role of natural ecosystems in modern agriculture. Elements of soil and water resources engineering are also involved in Illinois Planned Programs Natural Resource Management and Plant Health, Systems and Production.

Significant research projects are carried out in all four of the department's groups and contribute to the Extension and outreach program of the College. In addition to the research noted in other Planned Programs, research is conducted on agricultural infotonic systems, animal waste management, livestock production environments, and improving the value of coproducts produced in grain processing. Extension program teams have Extension Educators partnering with staff and faculty with joint Extension and Research appointments to further integrate research and Extension efforts. Agricultural Engineering also contributes significantly to work in manure management and integrated pest management. Agricultural and Biological Engineering is submitted as a Planned Program because of the critical role this area contributes to commercial agriculture and solving the problems facing the state of Illinois related to preserving soil, water, and air quality.

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 : Yes

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	0%		10%	
401	Structures, Facilities, and General Purpose Farm Supplies	40%		15%	
402	Engineering Systems and Equipment	0%		35%	
403	Waste Disposal, Recycling, and Reuse	50%		10%	
404	Instrumentation and Control Systems	5%		25%	
405	Drainage and Irrigation Systems and Facilities	5%		5%	
	Total	100%		100%	

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

1. Situation and priorities

Engineering technology plays a major role in developing and maintaining competitive livestock and crop industries in Illinois. It also contributes to increasing worker safety in agricultural and related industries. Such technology is also addressing concerns and problems related to odors/air quality, animal waste, animal treatment, and protection and management of water resources.

2. Scope of the Program

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

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

1. Assumptions made for the Program

That new technologies can be developed that are cost-effective in the field [and affordable for smaller producers] and that resources will be available to continue to develop and refine these technologies.

2. Ultimate goal(s) of this Program

To improve agricultural productivity through the use of intelligent machines, to integrating biological science and engineering for enhancement of living systems, and to utilize holistic approaches to provide engineering solutions. To mitigate conditions through knowledge and practices regarding radon in homes and manure management that preserve or improve water and air quality.

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	6.0	0.0
2010	3.0	0.0	6.0	0.0
2011	3.0	0.0	6.0	0.0
2012	3.0	0.0	6.0	0.0
2013	3.0	0.0	6.0	0.0

V(F). Planned Program (Activity)

1. Activity for the Program

Research activities include developing methods and techniques to reduce spray drift and to provide adequate coverage for controlling pest problems in field crops, research on agricultural infotronic systems and mass flow sensing, work to improve the application of pest control substances, research focusing on subsurface tile drainage systems, experiments to observe the nanostructure and the dynamics of zein protein aggregation, studies improving indoor air quality through contaminant control measures and improved ventilation design, and research to investigate the perceived effectiveness of innovative technologies to enhance teaching and learning. Extension activities will include web site expansion, online quizzes and training sessions to certify livestock managers are knowledgeable about manure management, and to ensure detection and mitigation of radon in homes.

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"> ● Group Discussion ● Education Class ● Workshop ● One-on-One Intervention ● Demonstrations 	<ul style="list-style-type: none"> ● Web sites

3. Description of targeted audience

Pesticide users [and environmentally-concerned citizens], crop growers, organic farmers and specialty-crop growers, animal producers [and all building designers in that improved ventilation technologies for agriculture buildings provide insights that can result in better-developed buildings for any use], agricultural engineers, homeowners, renters, building contractors, and realtors.

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	2500	100	100
2010	5000	2500	100	100
2011	5000	2500	100	100
2012	5000	2500	100	100
2013	5000	2500	100	100

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

Expected Patent Applications

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

3. Expected Peer Review Publications

Year	Research Target	Extension Target	Total
2009	25	1	26
2010	25	1	26
2011	25	1	26
2012	25	1	26
2013	25	1	26

V(H). State Defined Outputs

1. Output Target

- Number Of Completed Hatch Projects

2009 2 2010 2 2011 2 2012 2 2013 2

V(I). State Defined Outcome

O. No	Outcome Name
1	Number Of Subsurface Bioreactor Acres In Illinois
2	Producer Reported Changes/Improvement In Manure Management And Application Method To Reduce Odor And Notification Of Neighbors Of Planned Action
3	Radon Level In Homes Checked And Mitigated Where Discovered

Outcome #1

1. Outcome Target

Number Of Subsurface Bioreactor Acres In Illinois

2. Outcome Type : Change in Knowledge Outcome Measure

2009 :600 **2010 :** 900 **2011 :** 1200 **2012 :**1500 **2013 :**1800

3. Associated Institute Type(s)

•1862 Research

4. Associated Knowledge Area(s)

- 402 - Engineering Systems and Equipment
- 405 - Drainage and Irrigation Systems and Facilities

Outcome #2

1. Outcome Target

Producer Reported Changes/Improvement In Manure Management And Application Method To Reduce Odor And Notification Of Neighbors Of Planned Action

2. Outcome Type : Change in Action Outcome Measure

2009 :60 **2010 :** 60 **2011 :** 60 **2012 :** 60 **2013 :**60

3. Associated Institute Type(s)

•1862 Extension

4. Associated Knowledge Area(s)

- 403 - Waste Disposal, Recycling, and Reuse

Outcome #3

1. Outcome Target

Radon Level In Homes Checked And Mitigated Where Discovered

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

4. Associated Knowledge Area(s)

- 401 - Structures, Facilities, and General Purpose Farm Supplies

V(J). Planned Program (External Factors)

1. External Factors which may affect Outcomes

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

Description

External factors include development of new technologies in closely related fields, demand for a given agricultural product, environmental concerns, and the availability of resources.

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

1. Evaluation Studies Planned

- After Only (post program)
- Retrospective (post program)
- During (during program)

Description

Survey of livestock manager workshop attendees regarding practice changes.

2. Data Collection Methods

- Whole population
- Other (On-line survey)
- Sampling
- Mail

Description

Online surveys will be developed for users of website information and quizzes.

A sample of radon detection program attendees will be mailed a survey to determine if radon detection kits indicated the positive presence of radon in a residence and whether mitigation was completed.