

# 2007 University of Illinois Combined Research and Extension Annual Report

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## I. Report Overview

### 1. Executive Summary

#### The College of Agricultural, Consumer and Environmental Sciences in 2007

As our strategies are implemented in concert with the campus strategic plan, two overarching goals—global preeminence in our scholarship and exceptional value to society, especially on issues relevant to Illinois—frame the strategic intent of the College of ACES.

The operating budget for the College of ACES reflects a variety of funding streams that include tuition, local, state and federal appropriations, gift and endowed funding, ICR revenue, and self-supporting or cost-recovery funds. The core “state base” budget for FY 2008 is \$49,577,777, derived from tuition earnings and state general revenue appropriations, and is the primary fund used to pay salaries of faculty and permanent staff. Allocations to the College are used to construct departmental allocations that support individuals associated with the three mission areas – academic programs, University of Illinois Extension, and the Illinois Agricultural Experiment Station. The amount assigned to each of these categories is historical and reflects the sum of decisions made over many years. In recent years the portion of the “state base” attributable to student tuition has grown, with only modest increases in appropriated state support. This has led the College to question the appropriateness of the current model for the annual distribution of these funds. ACES is engaged in a process to analyze current and potential allocation models and to provide advice on a logical basis for allocation of funding consistent with expectations among the College’s mission functions.

#### The Office of Research in 2007 [Illinois Agricultural Experiment Station]

The most significant change occurred in September when Dr. Jozef L. Kokini was named Associate Dean and Director of the Office of Research. Prior to coming to the University of Illinois Dr. Kokini was the Chair of the Department of Food Science at Rutgers University.

The research component comprised \$62,127,602 of the total College of ACES expenditures (\$171,730,320) in FY 2007. Sources for Illinois Agricultural Experiment Station research expenditures were distributed as: 27% state appropriations, 7.5% state grants and contracts, 28.2% federal grants and contracts, 6.4% private gifts, 11.4% private contracts, 8.4% federal appropriations (Hatch Act), 8.7% revolving funds, and 2.7% institutional funds.

The most pressing current concern for the Office of Research is the potential loss of Formula Funds that would be directed instead toward competitive grants. While the University of Illinois is well-positioned to compete for these grants [and in fact may come out with a net win in the long-run], we feel that for several reasons Formula funds are uniquely positioned to serve the land grant mission. Formula funds provide institutions with the flexibility to invest in research areas important to stakeholders in Illinois and the North Central region through startup funding for faculty research programs and investment in emerging research areas. Such seed investments are excellent opportunities to garner external funding from other non-federal sources, thus expanding the impact of the initial investment. Formula funds also make a significant contribution to the recruiting and retention of top-flight investigators, supporting promising research proposals, and purchasing equipment for groups of investigators that individuals could not obtain on their own.

#### University of Illinois Extension in 2007

In FY 2007, expenditures for Extension represented 51.2% of total ACES expenditures and 74% of all Extension and outreach expenditures. All 102 counties support their local Extension programs through local tax levies and other sources. The state matches up to a portion equal to the amount of local funds provided, called County Board Match, appropriated through the Illinois Department of Agriculture. Both county and County Board Match funds have grown modestly since FY 2002, increasing 22% and 18%, respectively. Several other state funding lines in the IDOA have been added in this time frame. There are two currently in effect, one for \$5.055 million for the Cook County 21st Century Initiative and another for \$190,00 for AgrAbility. On the other hand, a state line item (\$1.65 million) in the IDOA budget that supported unit-based 4-H youth development educators was eliminated by line-item veto in FY 2008. Sources of revenue for University of Illinois Extension for FY 2007 were distributed as follows: 25.1% state appropriations, 11.9% state grants and contracts, 14.6% state county board match, 11.5% county contributions, 14.7%

federal appropriations, 1.8% federal grants and contracts, 6.0% private gifts and contracts, and 14.4% revolving institutional funds. As a consequence of nearly constant federal and state funding, faculty Extension specialist FTE's and center educators FTE's have decreased. The modest growth in county and county board match funds has supported some growth, particularly in the community and economic development positions.

Extension is fostering social and economic entrepreneurship in communities throughout Illinois, and is deliberately addressing the emerging needs of its citizens. Extension's sustained presence throughout Illinois has much to do with the clear signals that citizens have sent to policymakers that this outpost of the University of Illinois positively impacts many thousands of lives each year.

Extension is continually sharpening the focus of ongoing, more traditional approaches to programming relative to operational excellence, product leadership, and customer intimacy. The excellence of programming content is continually assessed and refined in the local market place. Program delivery is primarily by face-to-face contact (~2.8 million contacts/year) and by web-based interactions. More than 47,000 volunteers contribute to needs assessment, program direction, and evaluation. Problems are no longer solved with simple programs, single disciplines, or one-way communication. The issues addressed by Extension tend to be complex and systemic, whether connected to community and economic development, environmental quality, workforce preparedness, entrepreneurship, leadership, science and mathematics, citizenship, nutrition and wellness, or overall community health. These challenges require a holistic approach involving multiple stakeholders and ongoing dialogue. The approaches require new thinking, organization, and ways of interacting both internally and externally with constituents.

Extension has also expanded strategic acquisitions and other partnerships that strengthen the outreach portfolio to enable more effective decision making and policy formation by individuals, firms, and various private and civic organizations. Examples include:

Business and Industry Services (BIS) has provided over 6,000 organizations with customized training and consulting services.

Illinois-Indiana Sea Grant College Program addresses the critical concerns of resource sustainability, water quality, ecosystems and human health of the area of Lake Michigan bordered by the two states.

Illinois Water Resources Center promotes research, training, information dissemination, and other activities to meet Illinois' water resource needs.

Midwest Technical Assistance Center is comprised of a consortium led by the University of Illinois and the Illinois State Water Survey, in partnership with the land grant universities of Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, Ohio, and Wisconsin to serve small public water systems and public systems serving Indian tribes.

Energy Education Council addresses the public interest in energy issues by providing educational activities that promote safe and efficient use of electricity for consumers in 20 states.

#### Executive Summary – The Planned Programs

The 2007 Annual Report is focused on twelve major planned programs:

4-H and Youth Development – A variety of delivery systems, including community clubs, after-school programs, teacher training, conferences, and camps engaged youth in curricula on science, engineering, and technology (SET), healthy lifestyles, and youth leadership, the three national areas of focus for 4-H. Examples include Get Up and Move, a monthly series for youth groups that includes nutrition and physical exercise activities, Health Jam, a nine-week program to promote healthy lifestyles and health professions career education to elementary-age youth through an experiential approach to learning, and the development and piloting of a youth community informatics curriculum. In addition, social emotional learning, character education, and healthy relationships received attention through interdisciplinary efforts between Extension youth development staff and other Extension staff to develop educational programs and materials to address these areas. In addition, a total of ten topics were delivered to 4-H volunteers to increase their ability to serve as a caring adult and create a safe and structured environment that fosters positive youth development.

Agricultural and Biological Engineering – Activities include a multi-state project regarding aerial application of foliar fungicides for protection of corn from plant disease that was conducted in Illinois, Arkansas, and Kansas, installation of subsurface

bio-reactors in an attempt to provide a subsurface solution to a subsurface problem, efforts focused on creating an innovative concept of visual situation awareness technology for mobile agricultural machinery, a \$2 million grant received from the Energy Biosciences Institute [in the area of biomass feedstock production], a vision-based imaging system has been developed for liquid spray and other particle size measurement, presentations at the annual meetings of the Institute of Biological Engineering and the American Society for Agricultural and Biological Engineers, a study of how factors such as types of ventilation system, level of ventilation rate, and location of pollutant source affect air quality [in conjunction with the NE-1022 group], and development of a web-based instructional component for a graduate education program in Technical Systems Management. Major Extension activities focused on manure management and air quality, particularly radon detection. Training sessions and a website quiz series helped participants gain Certified Livestock Management status with respect to manure management. Radon education included workshops, distribution of literature and radon detection kits, and access to information on a website that was developed.

Agricultural and Consumer Economics – University of Illinois Extension conducted home buyer education single session or multi-week seminars partnering with various groups to sponsor or teach a portion of the programs. Extension also partnered with the United States Department of Justice (USDOJ) to offer a personal financial management course for debtors under the new bankruptcy legislation. Other Extension activities directed at consumers focused on fraud, consumer health care options, credit, planning ahead for retirement, and workforce preparation. Extension activities related to agricultural economics included Farm Income 2006 Workshops, Annie's Project, a series of sessions to educate women (and men) in five areas of production agricultural risk management, Andy's Project, focused on basic computer skills for agricultural producers, estate planning workshops, farmland leasing presentations, and MarketMaker, an interactive mapping system that finds producers and markets for agricultural products and serves as a resource for all businesses in the food supply chain. Activities also included research on legal issues related to biotechnology and intellectual property rights, presentations to the Illinois Bar Association, American Bar Association, and American Agricultural Law Association, participation in the NC-1014 Multistate Committee, the development of a unique [only one in the world] course on agro-industrial marketing taught to Executive MBA students in Argentina, contributions to several revised decision-making tools on Farmdoc [the goal of Farmdoc is to improve farm decision-making under risk through education and research], and research on small public water supply systems that has fostered collaborations with the U.S. EPA, Natural Resources Defense Council, and the Waterkeeper Alliance.

Animal Genomics - Activities include continuing to sequence the porcine genome, developing statistical and bioinformatics tools that provide accurate and precise results, thus supporting the effective application of genomics and proteomics information to the improvement of U.S. agriculture, the completion of a diagnostic test for Tibial Hemimelia that has been commercially licensed and performed on more than 16,000 animals since late 2005, work to identify genetic regions that influence the production and quality of pork, and research to establish which genes in the bovine mammary gland are involved in milk fat synthesis regulation to improve nutrient utilization and profitability of dairy farming. The CSREES Special Research Grant focused on sequencing the porcine genome was funded by reallocated Hatch dollars in FY 2007.

Animal Health and Production – Investigators found that distiller's dried grains with solubles could be blended with soy hulls as a quite satisfactory replacement for corn feed, collected data that will be used to develop a simulation model to improve trailer design, reduced animal stress levels and reduced economic loss during transportation of livestock, developed unique biotechnological strategies to improve animal growth efficiency, worked to prevent and control enteric diseases in swine and porcine reproductive and respiratory diseases, and investigated an outbreak of respiratory disease with a 30% mortality rate in an Illinois swine herd that occurred after a change in feed. 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 attended campus and off-campus sites. The Dairy Grazing Brown Bagger was offered as a distance delivery program on four consecutive Fridays in March. Four different topics were covered by speakers representing Penn State, Purdue, Illinois, and a nationally recognized dairy grazer from Indiana.

Biofuels – Research activities supported by Hatch funds include work to characterize biodiesel fuel and its properties in order to analyze its effects on combustion and emissions, process development studies for dry grind ethanol processes, efforts to optimize the dry grind ethanol fermentation process, an investigation of the use of the elusieve [a combination of sieving and elutriation] process to increase coproduct value while also decreasing costs, and the development of a mass-balance based spreadsheet model for dry grind ethanol economics.

Community Resource Planning and Development - Extension activities include a wide variety of methods focused on community planning and design, organizational development, economic development/sustainable communities, leadership development and education, local governance and public policy, agricultural entrepreneurship, small business/entrepreneurial education and assistance, recreation and tourism development, and diversity. Extension staff working in this area are currently

identifying priority activities as well as impact evaluation plans. Activities also include collaboration with Extension services in Kentucky, Missouri, Arkansas and Tennessee to educate citizens living in the New Madrid Seismic Zone about earthquake preparedness, research on water infrastructure governance and water infrastructure source protection, and a study of Latina/o immigrant remittances. The Certified County Officials program is a joint endeavor between University of Illinois Extension and the Illinois Association of County Board members and Commissioners. Since its inception in 2006, 417 county officials have registered for classes, and 41 have completed Level One Certification, which includes 24 hours of training. Research focused on rural prosperity funding resulted in the design of a training curriculum and associated materials on the topic of comprehensive strategic economic development planning focused on industry clusters and regional policy. The materials are now being used to train practitioners in courses throughout the nation including Illinois Extension staff and community development practitioners.

Food Product Development, Processing and Safety – Research activities include developing a MTS [manothermosonication] system that may provide a promising alternative for pasteurization of fruit and vegetable juices, work with dietary phytoestrogens with an emphasis on tumor growth, progression, and metastasis, developing novel packaging materials to preserve the environment by decreasing the use of non-degradable synthetic packaging materials, identifying key odorants in foods to evaluate shelf-life or used to examine the effects of processing and storage on product quality, and the development of effective biobased films able to function as direct substitutes for traditional petroleum-based products. University of Illinois Extension provides food safety training annually to employees of establishments that prepare or serve food. The five-hour Food Sanitation Refresher Course workshops helped 434 participants maintain their certification through this continuing education program and completion of a re-certification exam. Another major area of Extension programming focused on food safety is targeted at teaching youth correct hand washing and cleanliness habits when preparing food. Information is shared through presentations in pre-schools, schools, and 4-H materials and workshops.

Human Development – Workshops for “Intentional Harmony: Managing Work and Relationships” were presented to over 800 attendees, as well as working with the National Extension Marriage Couples Education Network to develop a National Extension Marriage and Couples Education Model. Parenting 24/7, a web-based resource that serves as a “one-stop” repository for parenting information that is produced by the University of Illinois Family Life team, was continued as a major outreach activity that provides research based articles, links to breaking news on child development, parenting, and family life, links to recommended websites, and video clips of actual parents talking about how they manage the challenges of raising children. A line of action-oriented research that examines the effectiveness of methods developed for improving sibling relationships among young children and the factors that predict more positive sibling interactions was extended. Research was conducted to identify the coping strategies of families that allow them to overcome the stressors associated with low-resource, high-risk neighborhoods, as well as those family factors that enhance families' vulnerability. A second Illinois Rainbow Families Conference was held in 2007 [targeting the needs of gay/lesbian parents in downstate Illinois]. Presentations have been made under this planned program to the National Council on Family Relations, the NICHD Transition to Fatherhood Research Network, the National Council on Black Studies, the XVth Biennial International Conference on Infant Studies, and the Biennial Meeting of the Society for Research in Child Development. Work continued in the expansion of the Child Development Laboratory Research Database.

Human Nutrition – A number of Extension programs focused on diabetes. “Dining with Diabetes” was taught as a three-part Extension program that combines lectures, food demonstrations, activities, and samples of healthy foods. In addition, a second series “Eating Well With Diabetes” is also offered. One-time diabetes programs include “Eating to Reduce the Risk of Diabetes”, “Diabetes and the Holidays”, and related topics on awareness and managing diabetes. Research activities include a study of the impact of eating cruciferous vegetables to reduce cancer risk, an evaluation of the absorption of health components from broccoli for maximum health benefits, work to develop a sustainable, functional dietary intervention strategy to reduce obesity and other related diseases such as insulin resistance and diabetes, and research designed to understand mechanisms of soy foods in colon cancer prevention. The CSREES Special Research Grant “Future Foods - Illinois”, which focuses on determining the effects of various soy components on health, wellness, prevention, and management of disease at various life stages, was funded by reallocated Hatch dollars in FY 2007.

Natural Resources and the Environment – Extension activities focused on tillage systems and soil and water conservation. Illinois Tillage Seminars have been held annually throughout Illinois for over 20 years. In February of 2007, the series of five workshops attracted 920 participants. A series of 10 soil and water workshops were held statewide using a combination of live presenters and teleconferencing for 225 participants focusing primarily on soils. A third major activity was the Eleventh Biennial Governor's Conference on the Management of the Illinois River System. The conference serves as an important forum to bring together local, state, and federal leaders to address the problems of the Illinois River System. Additional significant Extension activities include on-line courses for Certified Crop Advisers, conservation days conducted for youth, and pond management seminars for rural owners and members of homeowner associations. Research activities included work to understand the ecology of specific microbial populations involved in important wetland functions such as denitrification, a study to compare the influence of

organic transition plans differing in management intensity, an analysis of various GPS mapping strategies for manure application, monitoring of adult western corn rootworm movement, and work to determine relationships among nutrients in Illinois streams.

Plant Health, Systems and Production – Extension activities focus on both horticulture and agricultural crops. The Ask Extension—Hort Corner is a website that allows visitors to ask a question of a University of Illinois Extension Specialist or review the questions asked and answers received by previous visitors via an online web form. A series of 12 horticulture distance education programs, titled 4-Seasons, was offered at Extension offices throughout the state during the fall and winter months. Extension Master Gardener on-line and site training was conducted for 536 new Master Gardeners. Other horticulture plant health Extension programs were targeted at commercial growers of vegetables, tree fruits, small fruits, grapes, and turfgrass, as well as grounds maintenance workers through regional or statewide workshops. The plant clinic and Digital Diagnostic System provided extensive outreach to homeowners and commercial producers in diagnosing and sharing solutions for invasive and exotic species pest management and application of integrated pest management. Pesticide safety education was conducted at 88 locations. Operation S.A.F.E. fly-in was conducted in two locations in Illinois to make sure aerial applications of fungicides to corn are accurately and safely made. Extension worked with the Illinois Agricultural Aviation Association to check the spray pattern and droplet size of 32 aircraft and adjustments were made to the aircraft setup if needed. State and regional conferences/clinics and field days reach large numbers of corn and soybean producers with information on fertility and pest management. Two-day Regional Crop Management Conferences were held in three locations in 2007. Topics included carbon sequestration, crop water uses, and water quality issues along with 17 breakout sessions that addressed soil fertility and management and pest management issues from both economic and environmental perspectives. The primary audience was certified crop advisers (82%). New initiatives receiving attention focused on organic production, small tract farming, and local food systems through workshops, conferences, and demonstrations. The University has a full research portfolio addressing crop production, horticulture, and pest issues. Additional areas of research include using in vitro and somaclonal variation methods to develop unique fruit and vegetable plants, testing vegetable (tomato, broccoli) and fruit varieties for their potential use in organic production systems, using plant genetics and management techniques to improve the health-promoting properties of sweet corn [sweet corn delivers more carotenoids and tocopherols to American diets than nearly all other vegetables], and working to improve insect management in peach and apple crops with reduced use of insecticides.

#### Total Actual Amount of professional FTEs/SYs for this State

Year:2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	361.0	0.0	160.0	0.0
<b>Actual</b>	246.7	0.0	125.0	0.0

## II. Merit Review Process

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

- Internal University Panel
- Combined External and Internal University Panel

### 2. Brief Explanation

Program Reviews were conducted in one-fifth of the County Extension Units. Review teams included four or five state and local Extension staff who visited local Extension units. Staff from a given local office provided an overview of their programs and responded to questions from the review team. In addition, local stakeholders were interviewed by the review team to seek their input on program scope, quality, and suggestions for program additions and improvements. The review team shares recommendations with the local staff and those staff members in turn develop an action plan for responding. Local Extension advisory councils are involved in reviewing and providing input on the plans. Hatch projects are reviewed at the Department level before being submitted to CSREES, where they are again formally reviewed before being eligible for funding.

## III. Stakeholder Input

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

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

**Brief Explanation**

The Illinois Council on Food and Agricultural Research [C-FAR] is an important component of the College stakeholder input process. C-FAR and its stakeholder-based membership have created a new paradigm for food and agricultural research in Illinois. Food and agricultural leaders, government officials, researchers, and other dedicated individuals throughout Illinois are working together in an unprecedented manner to provide direction for targeted, high-quality research to support Illinois' number one industry. Also contributing to stakeholder input is the ABG "Vision for Illinois Agriculture" initiative. Leadership for this effort is being provided by the Illinois Agriculture Legislative Roundtable, and steering committee members include the College of ACES, the Illinois Farm Bureau, and the Illinois Department of Agriculture.

This past year no formal statewide stakeholder Extension input process was conducted; a process is being designed currently for initiation in 2008. Input was gathered in a variety of ways at the county level as questions arose that required input from stakeholders. Specifically, opportunities for grants often required stakeholder input. Community planning and economic development Extension activities also by their very nature involve stakeholder input. Program reviews in one-fifth of the local Extension units provided an opportunity to ascertain the actions taken with respect to stakeholder input. The actions taken most often involved targeted invitations to individuals and groups of traditional and non-traditional stakeholders by Extension and by any collaborators that were working with Extension staff to initiate community planning or exploration of potential issues that needed to be addressed.

**2(A). A brief statement of the process that was used by the recipient institution to identify individuals and groups stakeholders and to collect input from them****1. Method to identify individuals and groups**

- Use Advisory Committees
- Needs Assessments
- Other (Input From Collaborators Or Staff)

**Brief Explanation**

C-FAR's membership includes 60 statewide organizations, 38 university and research-based entities, and a host of individuals who also support food, agricultural, and related research in Illinois. Organizational members designate representatives to C-FAR who provide valuable stakeholder input into research direction setting. Phase One of the ABG "Vision for Illinois Agriculture" initiative took place in June of 2007 and was focused on gathering information from the steering committee, orienting the planning committee, and developing a communications plan. Phase Two occurred in August and focused on gathering input from industry leaders and identifying market trends.

Although the stakeholder input was decentralized primarily to the local level this past year, Extension Advisory Councils at the local, regional, and state level continue to be the key groups to provide advice on who should be invited and involved in a particular input opportunity. In addition, Extension staff are very involved in community collaborations at the local level and those groups are both targets for input or for identifying and including other representative stakeholders. Extension leadership at the regional and state level also network with traditional and non-traditional internal and external individuals and groups. It should be noted that staff continued to use the information gathered through more formal processes in the past which included focus groups of youth, key informant interviews, surveys of community leaders, and community forums.

**2(B). A brief statement of the process that was used by the recipient institution to identify individuals and groups who are stakeholders and to collect input from them****1. Methods for collecting Stakeholder Input**

- Meeting with traditional Stakeholder groups
- Meeting with traditional Stakeholder individuals
- Survey of traditional Stakeholder individuals
- Meeting specifically with non-traditional groups
- Survey specifically with non-traditional groups
- Meeting specifically with non-traditional individuals
- Meeting with invited selected individuals from the general public
- Other (Program Evaluation Instruments)

**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. Phase Three of the ABG initiative focused on the identification of issues and opportunities and was conducted in September.

Formal meetings of Extension Councils at the local, regional, and state level occur on a regular basis and are formally announced as open to the public by postings and media announcements. The primary focus of the groups is to discuss internal and external issues that Extension can or should address. In addition staff use meetings with collaborations, attendance at stakeholder groups, or appointments with individuals to collect input to guide programming decisions. In limited cases this year, formal surveys might have been used to formally gather input from non-traditional groups. Another key input method is the use of evaluation instruments to evaluate a given program through the inclusion of a question asking for additional needs related to that given program or to broader issues.

### **3. A statement of how the input was considered**

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

**Brief Explanation**

The C-FAR research portfolio is comprised of three research programs: the External Competitive Grants Program, University Internal Grants Program (at the University of Illinois, Southern Illinois University at Carbondale, Illinois State University, and Western Illinois University), and the Strategic Research Initiative Program. Research funded through these programs addresses practical, high-impact research needs and opportunities identified by industry stakeholders through C-FAR's research focus areas. Phase Four of the ABG initiative focused on vision and strategy development and was completed in late 2007.

Input was primarily used to redirect Extension programs and to identify and define emerging issues, and identifying specific programs to be designed and/or delivered. Extension Advisory Councils are involved to varying degrees in examining local budgets and priority setting. However, local stakeholders have been actively involved in contacting local, state, and federal government leaders to ensure passage or in many cases restorations of funding support for Extension. The Councils at the local level are involved in identifying staffing needs and selecting individuals [knowledgeable local stakeholders may be involved in interviewing potential candidates to seek their input]. Programs that address community planning or economic development often involve priority input from the stakeholder participants.

**Brief Explanation of what you learned from your Stakeholders**

Illinois is a leader in many food and agricultural areas. Publicly-funded research investments continue to be vital to our state's ability to compete and maintain preeminence. The unique partnership between Illinois' food and agricultural stakeholders and our state's research community via C-FAR ensures maximum impact and accountability for state research investments and makes certain Illinois remains competitive nationally and worldwide. Nearing completion is the final phase of the ABG initiative, the development of a strategy implementation action plan.

As mentioned, no systematic statewide input was gathered by Extension this past year, so a comprehensive description of what was learned from stakeholders cannot be briefly summarized. However, several new issues have emerged and new and traditional stakeholders are involved in providing input to describe needs and explore responses. Examples include support for developing local food systems, growing concern for the protection of natural resources and the environment, expanding immigration issues, health issues regarding chronic diseases and costs, and the need for individuals who can advance science and technology to improve our quality of life. At a recent meeting of the State Extension Advisory Council members discussed priority issues/marquee programs. Recommendations included: 1) equipping county staff with knowledge about Extension programs offered statewide so they are better prepared to market programs, 2) find issues and needs that haven't yet been served or are being served inadequately and develop programs for that target group (such as the elderly and retirees), and 3) pursue opportunities for corporate support for Extension. The state Program Planning Committee is developing a formal process to be used in the coming year to more systematically gather stakeholder input to identify priority issues for Extension.

**IV. Expenditure Summary**

<b>1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)</b>			
<b>Extension</b>		<b>Research</b>	
<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
8966829	0	9176748	0

<b>2. Totaled Actual dollars from Planned Programs Inputs</b>				
	<b>Extension</b>		<b>Research</b>	
	<b>Smith-Lever 3b &amp; 3c</b>	<b>1890 Extension</b>	<b>Hatch</b>	<b>Evans-Allen</b>
<b>Actual Formula</b>	10487155	0	5009369	0
<b>Actual Matching</b>	8966829	0	5009369	0
<b>Actual All Other</b>	68521489	0	40591649	0
<b>Total Actual Expended</b>	87975473	0	50610387	0

<b>3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous years</b>				
<b>Carryover</b>	1520326	0	1281017	0

**V. Planned Program Table of Content**

<b>S. NO.</b>	<b>PROGRAM NAME</b>
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	Animal Genomics
9	Biofuels
10	Human Development and Family Wellbeing
11	4-H Youth Development
12	Agricultural and Biological Engineering

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

Plant Health, Systems and Production

**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	0%		10%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Pla	0%		10%	
205	Plant Management Systems	30%		10%	
206	Basic Plant Biology	0%		10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	15%		5%	
212	Pathogens and Nematodes Affecting Plants	10%		20%	
213	Weeds Affecting Plants	10%		10%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		5%	
216	Integrated Pest Management Systems	30%		10%	
	<b>Total</b>	<b>100%</b>		<b>100%</b>	

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	27.0	0.0	18.0	0.0
<b>Actual</b>	41.0	0.0	28.8	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1742900	0	975121	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1490231	0	975121	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
11387844	0	12468137	0

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

The University of Illinois has a full research portfolio addressing crop production, horticulture and pest issues. Research and Extension programs are delivered through websites, face-to-face meetings and printed materials.

The Ask Extension—Hort Corner is a website that allows visitors to ask a question of a University of Illinois Extension Educator or review the questions asked and answers received by previous visitors via an online web form.

A series of 12 horticulture distance education programs titled 4-Seasons are offered annually at Extension offices throughout the state during the fall and winter months. Extension Master Gardeners give countless hours in providing horticulture information to the public. There are currently 3,400 active Master Gardeners in Illinois. This past year 536 new Master Gardeners were trained at 16 sites and 57 were trained through an on-line course. Other horticulture plant health Extension programs are targeted at commercial growers of vegetables, tree fruits, small fruits, grapes, and turfgrass, as well as grounds maintenance workers through regional or statewide workshops.

The plant clinic and Digital Diagnostic System, DD, provided extensive outreach to homeowners and commercial producers in diagnosing and providing solutions for invasive and exotic species pest management and application of integrated pest management. The system connects 95 local University of Illinois Extension field offices with over 50 University campus and field-based experts. The system utilizes a unique combination of hand held digital cameras, microscopes, and adapters that will allow the cameras to take pictures through a microscope. The equipment was upgraded in 2006-2007 through a state bio-terrorism grant.

Pesticide safety education was conducted at 88 locations. Topics included understanding pesticide basics, integrated pest management, protecting the environment from pesticides, understanding pesticide labels, application equipment and calibrations, and protecting humans from pesticide poisoning.

Operation S.A.F.E. fly-in was conducted in two locations in Illinois to make sure aerial applications of fungicides to corn are accurately and safely made. Extension worked with the Illinois Agricultural Aviation Association to check the spray pattern and droplet size of 32 aircraft and adjustments were made to the aircraft setup if needed.

State and regional conferences/clinics and field days also reach large numbers of corn and soybean producers with information on fertility and pest management. Two-day Regional Crop Management Conferences were held in three locations in 2007. Topics included carbon sequestration, crop water uses, and water quality issues along with 17 breakout sessions that addressed soil fertility and management and pest management issues from both economic and environmental perspectives. The primary audience was certified crop advisers (82%).

New initiatives receiving attention focused on organic production, small tract farming, and local food systems through workshops, conferences, and demonstrations.

Areas of research included using in vitro and somaclonal variation methods to develop unique fruit and vegetable plants, testing vegetable (tomato, broccoli) and fruit varieties for their potential use in organic production systems, using plant genetics and management techniques to improve the health-promoting properties of sweet corn [sweet corn delivers more carotenoids and tocopherols to American diets than nearly all other vegetables], and working to improve insect management in peach and apple crops with reduced use of insecticides.

Two important research programs that had been funded by CSREES Special Research Grant funding were funded by Hatch in FY 2007. These programs focused on integrated pest management [enhancement of an integrated management approach for Chenopodium weeds and more judicious use of herbicides] and supporting the Soybean Disease Biotechnology Center [established with the mission to identify current useful technologies to protect the U.S. soybean crop and to seek out and facilitate the implementation of novel strategies and technologies to reduce losses and increase profitability for the U.S. soybean industry].

## **2. Brief description of the target audience**

The target audiences included agricultural producers, certified crop advisers, horticulturists, industry representatives, homeowners, Extension Master Gardeners, retailers of horticultural products, and members of the general public with a horticultural interest.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

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

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	52650	2548000	4000	228000
2007	137631	43931	256196	0

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

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	1
2007 :	3

**Patents listed**

Three patents were applied for, numbers 60/829,123, 11/562,244, and 11/770,030.

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

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	9	85	94

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of research publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	92	85

**Output #2**

**Output Measure**

- Number of completed research projects

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	25	8

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

O No.	Outcome Name
1	Number of participants demonstrating changes in KASA
2	Number of participants exhibiting or reporting changes in practice including improved decision-making.
3	More Careful Users Of Garden Chemicals [Including Pesticides And Fertilizers]
4	Improvement Of The Use Of Asexual Techniques For Plant Development
5	Improving The Productivity Of Organic Farming To Meet Increasing Demand
6	Percentage Of Nitrogen Utilization By Wheat

**Outcome #1****1. Outcome Measures**

Number of participants demonstrating changes in KASA

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	25300	5630

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

After pesticide safety education training, 5,487 participants took a 50 question closed book examination given by the Illinois Department of Agriculture and passed an exam qualifying them for licensing as a private applicator of pesticides in Illinois. Seventeen home gardeners selected and planted new spring bulbs. 126 Regional Crop Management Conference attendees self-reported that they felt their knowledge of new crop management techniques was increased by attending one of these three workshops.

**4. Associated Knowledge Areas**

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

**Outcome #2****1. Outcome Measures**

Number of participants exhibiting or reporting changes in practice including improved decision-making.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	17070	33

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Damage by exotic or invasive pests can result in economic losses

**What has been done**

The University of Illinois Extension Distance Diagnostics System received and diagnosed 792 samples of insects and diseased plants this past year from 77 Extension offices. Thirty-one Extension educators and specialists provided diagnosis with a median response time of 12.5 hours. Sample types included: 669 general home horticulture samples, 69 commercial agriculture samples (including 7 suspected Soybean Rust samples), 39 commercial horticulture and fruit samples, and 24 turf samples.

**Results**

A random sampling of 25 samples were selected and analyzed for the potential savings related to accurate problems diagnosed and implementation of recommended action. The sample represented 9 that required no treatment, 8 that required a recommended treatment, 4 that were inconclusive requiring more information, 3 that were curiosity samples (What's this insect or plant?), and 1 training/system test sample.

The estimated potential financial impact of the 8 samples requiring treatment follows: 1) \$15,000 in home damage repairs saved through treatment of diagnosed termite problem, 2) \$150 fruit tree and fruit replacement cost through pest identification and treatment, 3) \$60 total for 4 properly treated weed infestations, 4) \$250 of household goods saved through treatment of carpet beetle infestations, and 5) \$30 replacement value of infested large houseplant. The total of mitigated losses through problem identification and subsequent decision by the client to act on the recommended treatment is estimated to be \$15,490. The extrapolated impact, if the sample is indicative of the total samples submitted for the year, would be \$500,000.

Although not included in this sample, seven suspected Soybean Rust samples were submitted during last year. All were identified as negatively infected saving \$12,000 in pesticide application costs.

It should be noted that the qualitative impact of the 9 samples in the random subset that required no treatment would have an impact on the mental and physical well-being of the client and environmental protection impact due improper or unnecessary pesticide use.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
205	Plant Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
206	Basic Plant Biology
213	Weeds Affecting Plants
214	Vertebrates, Mollusks, and Other Pests Affecting Plants
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

**Outcome #3****1. Outcome Measures**

More Careful Users Of Garden Chemicals [Including Pesticides And Fertilizers]

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2007	{No Data Entered}	200

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The demand for good horticultural information for homeowners frequently outstrips the supply.

**What has been done**

Survey of Ask Extension - Hort Corner users provided information via an on-line survey regarding their satisfaction with the quality of the response and web site. The survey was distributed to 592 individuals who posted questions between April 1, 2007 and October 1, 2007. There were 159 respondents.

**Results**

Of the Ask Extension - Hort Corner participants who followed the suggestion provided, all but ten were satisfied or somewhat satisfied with the results of the suggestion. When asked to rate the website from 1 to 5 (5 being best), 83% of the 157 respondents chose a rating of four stars or better and 65% chose educational institution websites as most accurate when compared to other sources of horticulture information.

**4. Associated Knowledge Areas**

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

**Outcome #4****1. Outcome Measures**

Improvement Of The Use Of Asexual Techniques For Plant Development

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

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

The public's concern with the real or perceived safety of genetically modified organisms has forced plant geneticists to reconsider the importance of some other methods of plant improvement. Somaclonal variation, heritable changes that resulted from in vitro procedures, is one such method.

**What has been done**

We have developed methods to make virus-free horseradish plants using meristem cultures. We have also published methods to regenerate shoots from horseradish leaves and cell masses. Several cultivars were field tested.

**Results**

We expect that our methods will be used to establish a certified plant program for horseradish.

**4. Associated Knowledge Areas**

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

**Outcome #5**

**1. Outcome Measures**

Improving The Productivity Of Organic Farming To Meet Increasing Demand

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

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

The organic food industry is still growing at close to 20% per year. We estimate that at least 250 more organic farmers are needed within the next 5-10 years, and that existing farmers need to grow larger to meet the demand.

**What has been done**

Transition trials were completed on the Windsor Organic Research Transition plots on the University of Illinois South Farm Research and Education Center in Champaign. Results are demonstrating the relative economics of low intensity, intermediate intensity, and high intensity agricultural "transition to organic" production systems.

**Results**

Based on current findings, it appears that the high-intensity transition program is most economically viable. To disseminate results from research related to organic production around the state, the Third Annual Organic Production Conference was held in December. The program included popular presentations by researchers, Extension staff, farmers, marketers, and others interested in increasing organic production in Illinois.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
205	Plant Management Systems

**Outcome #6****1. Outcome Measures**

Percentage Of Nitrogen Utilization By Wheat

**2. Associated Institution Types**

- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	50

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

Illinois is the second leading producer of soft red winter wheat in the United States. Only about 50% of nitrogen is currently utilized by wheat, and even a five to fifteen percent gain in N use would mean a significant gain in yield or reduction in N utilized [or perhaps both], resulting in benefits to both growers and the environment.

**What has been done**

We are currently evaluating new nitrogen technologies and investigating the potential of utilizing crop sensors for increasing nitrogen use efficiency of wheat after soybeans and after corn.

**Results**

A field study has been established at two southern Illinois locations to provide the data that will be compared to our estimates above.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
205	Plant Management Systems

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)

**Brief Explanation**

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

**1. Evaluation Studies Planned**

- After Only (post program)
- Retrospective (post program)
- Other (Observation of Aircraft spray adjustments)

**Evaluation Results**

A survey was conducted with 592 individuals who posted questions between April 1, 2007 and October 1, 2007 on the Ask Extension—Hort Corner web site. There were 159 respondents. When asked if the web site expanded their knowledge of horticulture, over 86% of the 148 respondents to that question indicated that the site had increased their knowledge at least somewhat with nearly 34 percent (50 individuals) indicating the site had increased their knowledge to a large or very large extent. When asked if the web site information helped them become a more careful user of gardening chemicals, 54 (39.7%) of the 136 respondents to the questions replied “yes”, 64 (39.7%) were already careful users, and 28 (20.6%) replied “no.”

Two of the 4-Seasons homeowner horticulture series of distance education programs were selected for a follow-up evaluation. Spring Lawn Care was attended by 194 participants at 42 Extension offices with a goal of reducing chemical inputs on lawns and to seriously evaluate what is an acceptable turfgrass quality and quantity for their property. Minor Spring Bulbs was presented to 251 participants from 48 Extension office sites. The programs had 53 and 57 participants respectively who volunteered to be contacted via email to complete an on-line follow-up survey allowing time for participants to implement practices. Practices implemented most often by the respondents to the survey included: 1) applying fertilizer to lawns at the proper time by 16 (75%) of the respondents, 2) implementing or changing weed control practices by 11 (21%) of the respondents, and 3) selecting and planning new spring bulbs by 17 (68%) of the respondents.

A retrospective evaluation was conducted via an on-line survey by the state Coordinator of Master Gardeners to assess Master Gardener practice changes. The survey, sent to 400 master gardeners in the 2006 training class, included a self assessment of 12 gardening practices, 11 personal improvement skills, and their experience in teaching horticulture topics.

Of the 146 respondents to the question that asked how often they used pesticides only according to the directions, 134 (92%) indicated they often did so after the training as compared to only 97 (65%) who indicated they often did so before the MG training.

Of the 152 respondents to the questions that asked how often they chose plant varieties that are known to be resistant to insects and diseases, 127 (83%) often did so after the training as compared to 42 (28%) who often did so before the MG training. Other notable practice increases after training included installing, mulching, and pruning landscape plants properly.

With respect to development of personal skills, 96% of the 148 respondents indicated that involvement in the Master Gardener program helped them to 'somewhat', 'very much', or 'greatly' increase: 1) communicating more effectively with others, 2) work more productively with a group, and 3) be willing to accept more challenges.

More than two-thirds of the respondents indicated that they had sometimes or often taught programs to the public on the following topics: choosing landscape plants based on the conditions at the planting site, choosing plant varieties that are known to be resistant to insects and diseases, installing landscape plants properly, mulching landscape plants properly, pruning landscape plants properly, identifying an insect, disease or weed problem before deciding on a control method, using pesticides only according to the directions, and recycling organic material in the yard through mulching and composting.

Observation of 32 aircraft spray patterns and spray droplet size and subsequent corrections made on site during Operation S.A.F.E. Fly-in are estimated to ensure that fungicide was applied correctly and directly on 3-4 million acres of corn by those aircraft.

### **Key Items of Evaluation**

**Program #2**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Community Resource Planning and Development

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
608	Community Resource Planning and Development	80%		50%	
802	Human Development and Family Well-Being	0%		15%	
803	Sociological and Technological Change Affecting Individuals,	5%		10%	
805	Community Institutions, Health, and Social Services	10%		15%	
806	Youth Development	5%		10%	
	<b>Total</b>	<b>100%</b>		<b>100%</b>	

**V(C). Planned Program (Inputs)**

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	12.0	0.0	3.0	0.0
<b>Actual</b>	60.3	0.0	3.2	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2563338	0	134811	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2191730	0	134811	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
16748463	0	455913	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Extension activities include a wide variety of methods focused on community planning and design, organizational development, economic development/sustainable communities, leadership development and education, local governance and public policy, agricultural entrepreneurship, small business/entrepreneurial education and assistance, recreation and tourism development, and diversity. Extension staff working in this area are currently identifying priority activities as well as impact evaluation plans. Activities also include collaboration with Extension services in Kentucky, Missouri, Arkansas and Tennessee to educate citizens living in the New Madrid Seismic Zone about earthquake preparedness, research on water infrastructure governance and water infrastructure source protection, and a study of Latina/o immigrant remittances.

The Certified County Officials program is a joint endeavor between University of Illinois Extension and the Illinois Association of County Board members and Commissioners. Since its inception in 2006, 417 county officials have registered for classes, and 41 have completed Level One Certification, which includes 24 hours of training.

Research focused on rural prosperity funding resulted in the design of a training curriculum and associated materials on the topic of comprehensive strategic economic development planning focused on industry clusters and regional policy. The materials are now being used to train practitioners in courses throughout the nation including Illinois Extension staff and community development practitioners.

**2. Brief description of the target audience**

Community leaders, agencies and organizations, and local government officials involved in community and economic development. Other target audiences include youth and residents interested in starting small businesses.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

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

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	21000	0	500	0
2007	58240	56448	26047	0

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

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	0
2007 :	0

**Patents listed**

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

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	7	7

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of research publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	16	7

**Output #2**

**Output Measure**

- Number of research projects completed.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	3	0

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

O No.	Outcome Name
1	Number of individuals demonstrating KASA and related changes.
2	Number of individuals demonstrating behavior changes such as improved practices or improved decision-making
3	Assessing Community Capacity For Water Infrastructure And Resource Management
4	Community Planners Increase Knowledge Of Factors Related To Rural Prosperity

**Outcome #1****1. Outcome Measures**

Number of individuals demonstrating KASA and related changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	4500	27

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

27 Participants in the Certified County Official workshop on Best Management in Financial Management indicated the the material presented was somewhat or extremely new to them.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
608	Community Resource Planning and Development

**Outcome #2****1. Outcome Measures**

Number of individuals demonstrating behavior changes such as improved practices or improved decision-making

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	2250	304

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

304 individuals enrolled in the Certified County Officials program when surveyed indicated that they used the information in a given module to make decisions.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
608	Community Resource Planning and Development

**Outcome #3**

**1. Outcome Measures**

Assessing Community Capacity For Water Infrastructure And Resource Management

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Water quality and availability are considered by many to be the critical issues of the 21st century. Some communities have been more successful than others at managing water infrastructure and resources. Understanding why will be critical to increasing and maintaining access to potable water and protection of water quality. This research aims to understand the factors that lead to the development of "civic infrastructure" or the capacity to manage water and wastewater. We will focus on the existence of local leadership and the role of government institutions, financing organizations, and Extension or non-profit intermediaries in building community capacity.

**What has been done**

Over the last year we have engaged in research on water infrastructure governance and water infrastructure source protection. This research took four forms: 1) The analysis of social networks and coalitions involved in water quality protection in Iowa; 2) Analysis of the infrastructure support networks in the United States and internationally; 3) Analysis of critical issues in water infrastructure management in the U.S.; and 4) Analysis of the impacts of water privatization in the U.S.

**Results**

Outcomes from this research include the following: Change in Knowledge: 1) Through the research on coalitions and infrastructure, there has been a change in the understanding of the critical factors in water infrastructure. This research is demonstrating that while technology and money are important and regulatory frameworks may protect water resources, social networks have a critical impact on water supply and the infrastructure to deliver it to people. 2) Through the research on water privatization, we have discovered that private sector participation is greatest in very small community water systems. These very small water systems are most likely to suffer from violations of water quality standards, to have higher water rates, and to have under-qualified water operators. 3) The research on small community water systems has led to findings indicating that there are a number of social issues in the sustainability of community water systems including the problems of aging water operators, access to information, and relationships with community water governance boards. Change in Actions: The changes in knowledge have led to changes in the focus of research: 1) In the case of water privatization, a new focus on small community water systems; and 2) A focus on management issues in small community water system research.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
608	Community Resource Planning and Development

**Outcome #4****1. Outcome Measures**

Community Planners Increase Knowledge Of Factors Related To Rural Prosperity

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

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

A sustained and systematic effort is needed to disentangle the various forces influencing the prosperity of rural and urban regions, to understand the linkage between development institutions, policy making processes, and implementation to policy outcomes, and to engage decision makers directly in debates about the future of rural communities, cities and regions in an increasingly globalized economy.

**What has been done**

The Regionalism and Clusters for Local Development research project resulted in designing a training curriculum and materials addressing comprehensive strategic economic development planning focused on industry clusters and regional policy. The materials are being used to train practitioners throughout the nation. Training included a session for Illinois Extension and economic development practitioners, one on regional economic competitiveness for the Illinois Planning Institute, and one for county commissioners on data support systems for understanding local economies.

**Results**

Our research focused on rural prosperity rather than rural poverty. We found that more than 300 rural counties and 200 mixed rural counties are more prosperous than the nation as a whole; having lower unemployment, poverty, and school dropout rates and better housing conditions. Among the 1,317 most rural counties, 21% meet these criteria. Rural counties in The Plains, Great Lakes, and New England are most likely to be prosperous, as well as those near urban labor markets. Less than one of 20 rural counties with as little as 10% of the population African-American, American Indian, or Hispanic is prosperous. Initial statistical results on why some communities prosper and others do not indicate that religious and other identities that bind people together matter. Communities with more people with some college education and those with vigorous private economies are more likely to prosper. Geographical factors that are impossible or expensive to change (climate, distance to cities, etc.) are relatively unimportant in distinguishing between prosperous and other rural places. Our county prosperity ratings are being used by the U.S. Department of Health and Human Services.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
608	Community Resource Planning and Development
805	Community Institutions, Health, and Social Services

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Economy
- Competing Programatic Challenges

## Brief Explanation

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

#### 1. Evaluation Studies Planned

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

#### Evaluation Results

As a result of evaluations a survey of Illinois Water Operators has been added. Illinois operators were hungry to tell their story and the results are likely to leverage further funding for research in this area.

#### Key Items of Evaluation

Meetings were held with representatives from commodity groups, non-governmental organizations, government officials and academic institutions to guide future research in water infrastructure management.

**Program #3**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Animal Health and Production

**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 Management Systems	25%		10%	
311	Animal Diseases	30%		25%	
315	Animal Welfare/Well-Being and Protection	5%		10%	
806	Youth Development	25%		0%	
<b>Total</b>		100%		100%	

**V(C). Planned Program (Inputs)**

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	14.0	0.0	18.0	0.0
<b>Actual</b>	14.0	0.0	23.1	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
595136	0	919890	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
508859	0	919890	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
3888532	0	12383760	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Investigators found that distiller's dried grains with solubles could be blended with soy hulls as a quite satisfactory replacement for corn feed, collected data that will be used to develop a simulation model to improve trailer design, reduced animal stress levels and reduced economic loss during transportation of livestock, developed unique biotechnological strategies to improve animal growth efficiency, worked to prevent and control enteric diseases in swine and porcine reproductive and respiratory diseases, and investigated an outbreak of respiratory disease with a 30% mortality rate in an Illinois swine herd that occurred after a change in feed [the first reported outbreak of fumonisin induced toxicity in swine since 1989].

Presentations were made to a wide variety of researchers and stakeholders, including the joint meeting of the American Dairy Science Association and the American Society of Animal Science, the Society for the Study of Reproduction, the American Society for Cell Biology, and the 2007 Conference of Research Workers in Animal Diseases.

The use of technology is a growing delivery system for Extension programs addressing animal production and health. The Illinois Livestock Trail website added a Certified Livestock Manager Training section and youth oriented Livestock E-Quiz section. MarketMaker, an interactive multi-state market system developed by the University of Illinois that locates businesses and markets for agricultural products, has expanded geographically with over half the states in the nation considering a formal partnership in developing the network. The data currently encompasses 200,000 profiles of farmers and other food related enterprises in Illinois, Iowa, Georgia, Mississippi, Nebraska, Kentucky, Michigan, and New York. 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 at campus and off-campus program sites. Programs on pasture management for livestock production is a continuing focus. This past year the Dairy Grazing Brown Bagger was offered as a distance delivery program on four consecutive Fridays in March. Four different topics were covered by speakers representing Penn State, Purdue, Illinois, and a nationally recognized dairy grazier from Indiana.

## 2. Brief description of the target 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, and livestock trailer manufacturers.

## V(E). Planned Program (Outputs)

### 1. Standard output measures

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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	65000	60500	28000	4600
2007	57699	26914	65870	0

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

#### Patent Applications Submitted

Year	Target
Plan:	0
2007 :	0

#### Patents listed

### 3. Publications (Standard General Output Measure)

#### Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	67	67

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of research publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	84	67

**Output #2**

**Output Measure**

- Number of completed extension projects.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	19	10

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

O No.	Outcome Name
1	Program participants will exhibit/report KASA changes.
2	Number demonstrating/reporting behavior changes including improved decision-making
3	Improved Environmental Control For Biological Structures
4	Decreasing The Risk Of Periparturient Diseases In Dairy Heifers

**Outcome #1****1. Outcome Measures**

Program participants will exhibit/report KASA changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	85000	15

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

Livestock producers face management challenges, including grazing management, in achieving a profitable enterprise.

**What has been done**

The Dairy Grazing Brown Bagger was a distance delivery program offered for the first time in March 2007 on four consecutive Fridays from noon to 1:15 pm. Participants (dairy graziers) dialed in from their home/office utilizing an 800 phone number. In addition to the audio via phone, they viewed Power Point slides of the speaker's presentation (sent on a CD). A Question & Answer session followed the hour-long presentation. There was a different topic and speaker at each of the four sessions. Topics addressed were: Transition to and Strategies for Pasture Based Feeding Systems in Illinois, Supplementation of Pasture Forages to Optimize Production & Reproduction in a Pasture Based Dairy System, Forage Specie Selection & Management with Emphasis on Productivity & Longevity for a Pasture Based Dairy System, and Thinking Outside the Box with a Pasture Based Dairy System. Speakers represented the Universities of Penn State, Purdue, and Illinois plus a nationally recognized dairy grazier from Indiana.

**Results**

Fifteen of the 21 participants (16 Illinois Dairy graziers, 3 out-of-state graziers, and 2 industry representatives) returned a questionnaire mailed to them a few days after the last session. All respondents strongly agreed or agreed that the distance delivery format and quality was acceptable, that they would like to see another series next year, and that the program will help them to make more informed dairy grazing management decisions. (See specific planned practice changes in the evaluation section of this planned program report.) Ten of the respondents indicated they planned to increase the acres of pasture in the coming year and five indicated they planned to maintain their pasture acreage.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection
302	Nutrient Utilization in Animals
301	Reproductive Performance of Animals
307	Animal Management Systems
311	Animal Diseases
806	Youth Development

**Outcome #2****1. Outcome Measures**

Number demonstrating/reporting behavior changes including improved decision-making

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	52500	0

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

Data was not collected for this Outcome Indicator in 2007.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection
301	Reproductive Performance of Animals
806	Youth Development
311	Animal Diseases
302	Nutrient Utilization in Animals
307	Animal Management Systems

**Outcome #3****1. Outcome Measures**

Improved Environmental Control For Biological Structures

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

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

Animal transportation has been recognized as an important aspect which affects meat quality and profit in pork production. Transportation consists of not only the on-road travel to the processing plant, but also the loading, waiting, and unloading that occurs during a typical journey. Estimates show that 80,000 pigs die annually during transport, 70% on the truck and 30% shortly after arrival, for a cost of 8 million dollars to the pork industry. Transport is the most influential pre-slaughter treatment because it affects both meat quality and quantity.

**What has been done**

The purpose of this study is to understand the micro-environment conditions of pigs during transport. A straight double deck trailer with eleven compartments was outfitted with instrumentation to measure temperature, humidity, carbon dioxide, and air velocity within each compartment, in addition to outside temperature, humidity, incident solar radiation, truck speed, trailer side, front and roof temperature, and skin surface temperature in two compartments. An instrumentation system, including an air velocity sensor, has been developed for this study. Sensors in protective cages were positioned in the compartments with the animals.

### Results

The data collected in this study are important to evaluate the animal micro-environment during transport. The data collected can be used for a variety of analyses during different parts of the trip. Time stamps and a six-second collection frequency allows for accurate time related interpretations in terms of heat transfer and animal heat or cold stress. This data can also be used to help develop a simulation model to improve trailer design, reduce animal stress levels, and reduce economic loss during transportation.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
315	Animal Welfare/Well-Being and Protection

#### Outcome #4

##### 1. Outcome Measures

Decreasing The Risk Of Periparturient Diseases In Dairy Heifers

##### 2. Associated Institution Types

•1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

##### 3c. Qualitative Outcome or Impact Statement

###### Issue (Who cares and Why)

Feeding high energy diets to cows during late pregnancy adversely affects responses to cows around and after calving, even when the cows are not too fat. First-calving heifers make up 35 to 50% of the cows in dairy herds, yet little is known about how best to manage these heifers before calving to minimize subsequent health problems.

###### What has been done

We determined responses of adipose (fat) tissues and liver to overfeeding versus slight underfeeding and feeding to requirements during late pregnancy that may be associated with increased incidence of disease. Such knowledge allows better feeding recommendations to farmers to improve animal well-being and profitability of dairy farming.

###### Results

This project led to a change in knowledge of both fundamental and applied aspects of dairy cattle nutrition and physiology. Our findings demonstrate that allowing cows to consume an excess of dietary energy during the 6-8 week period of late gestation before calving (the dry period) leads to inflammatory responses in liver and adipose tissue that may contribute to disease around calving. These inflammatory changes are prevented by feeding a lower-energy high-bulk diet rich in straw or other slowly digestible roughages. The applied aspects of this project have led to a change in actions of dairy producers and their advisors. The dietary changes are being widely implemented around the United States and worldwide. Implementation of our findings has led to a change in conditions for dairy producers and dairy cows. By lessening disease around and after calving, dairy producer incomes have been positively affected. Well-being of the cows has also been improved.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
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302	Nutrient Utilization in Animals
315	Animal Welfare/Well-Being and Protection
307	Animal Management Systems

## V(H). Planned Program (External Factors)

### External factors which affected outcomes

- Economy
- Competing Public priorities

### Brief Explanation

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

### 1. Evaluation Studies Planned

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

### Evaluation Results

A follow-up evaluation, sent via mail with a self-addressed, postage paid envelope to 21 participants in the Dairy Brown Bagger distance education 4 part-series a few days after the final session, was returned by 15 participants. In response to the evaluation request to "List one technique learned during this program that you plan to implement", thirteen provided a response. The responses are as follows:

- Changes I can make to improve my ration to make it more compatible to the pasture
- Stop buying prepackaged pasture mixes because they are likely to be the wrong specie, wrong variety, and wrong ratio
- Possibly feeding corn cobs to dairy herd or may pick my corn in ear this fall instead of shelling
- Grazing of cornstalks, oats, and turnips
- The use of turnips for late season pasture
- Feeding strategies to compliment higher energy costs
- Estimation of pasture dry matter using a plate meter
- Rotational grazing
- Tri strip grazing
- Summer annuals and multi-cropping
- Monitor pasture growth better and try not to overgraze
- Do more grazing with cattle
- New ideas to reestablish pastures.

### Key Items of Evaluation

**Program #4**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Natural Resources and the Environment

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
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%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	14.0	0.0	20.0	0.0
<b>Actual</b>	10.3	0.0	15.9	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
437850	0	920261	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
374375	0	920261	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
2860849	0	2080576	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Extension activities focused on tillage systems and soil and water conservation. Illinois Tillage Seminars have been held annually throughout Illinois for over 20 years. In February of 2007, the series of five workshops attracted 920 participants, the largest total attendance ever due to personal invitations to Certified Crop Advisers.

A series of 10 soil and water workshops were held statewide using a combination of live presenters and teleconferencing. The 225 participants were provided with information on the following topics: 1) Illinois soils, 2) soils, the carbon cycle, and climate change, 3) recycling soil, 4) soils and the phosphorus cycle, and 5) soils and soil microbes.

A third major activity was the Eleventh Biennial Governor's Conference on the Management of the Illinois River System. The planning committee for the past twelve conferences has been chaired by an Extension staff member and involves over 30 representatives of agencies and organizations throughout Illinois. The conference serves as an important forum to bring together local, state, and federal leaders to create awareness of the problems of soil erosion and sedimentation, identify important river research initiatives, develop working coalitions, apply conservation practices to the watershed, prepare new river and watershed legislation, and provide for state and federal funding to address the problems of the Illinois River System.

Additional significant Extension activities include online courses for Certified Crop Advisers, conservation days conducted for youth, and pond management seminars for rural owners and members of homeowner associations.

Research activities included work to understand the ecology of specific microbial populations involved in important wetland functions such as denitrification, a study to compare the influence of organic transition plans differing in management intensity, an analysis of various GPS mapping strategies for manure application, monitoring of adult western corn rootworm movement, and work to determine relationships among nutrients in Illinois streams.

## 2. Brief description of the target 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 consultants, farmers, drainage contractors, livestock producers, livestock commodity groups, environmental regulatory agencies, and youth.

## V(E). Planned Program (Outputs)

### 1. Standard output measures

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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	11000	180	15600	3090
2007	69321	15900	38692	0

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

#### Patent Applications Submitted

Year	Target
Plan:	0
2007 :	1

#### Patents listed

Patent application number 7,285,419

### 3. Publications (Standard General Output Measure)

#### Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	2	42	44

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of research publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	90	42

**Output #2**

**Output Measure**

- Number of completed research projects.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	20	6

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

O No.	Outcome Name
1	Program participants will report/demonstrate KASA changes.
2	Participants will demonstrate behavior changes including improved decision-making.
3	Control Of Dispersal And Disease Transmission By Rotation-Resistant Western Corn Rootworms
4	Knowledge Of Soil Composition
5	Aspirations To Reduce Tillage In Crop Production
6	Drainage Water Management System Acres

**Outcome #1****1. Outcome Measures**

Program participants will report/demonstrate KASA changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	18700	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

Data is reported under the more specific outcome indicator/measure that was added to this planned program report.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
133	Pollution Prevention and Mitigation
806	Youth Development
605	Natural Resource and Environmental Economics
405	Drainage and Irrigation Systems and Facilities
112	Watershed Protection and Management
123	Management and Sustainability of Forest Resources

**Outcome #2****1. Outcome Measures**

Participants will demonstrate behavior changes including improved decision-making.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	3300	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done****Results**

Data is included under the more specific outcome indicator/measure added to this planned program report.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
133	Pollution Prevention and Mitigation

**Outcome #3****1. Outcome Measures**

Control Of Dispersal And Disease Transmission By Rotation-Resistant  
Western Corn Rootworms

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

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

A behavioral change by the western corn rootworm has caused crop rotation to fail as a control tactic for this pest; adult feeding in soybeans can spread bean pod mottle virus leading to crop losses. This study examines western corn rootworm adult movement over time and the relationship between bean pod mottle virus, insect vectors, and the role that environmental factors play in the disease.

**What has been done**

Since the mid-1990's, western corn rootworms (WCR) have begun to lay eggs outside of cornfields in east central Illinois, causing crop rotation to fail as an IPM practice. From 1998 to 2006, WCR adult movement from corn into soybeans was monitored with cucurbitacin vial traps placed in adjacent corn and soybean fields. Trap lines were established near Urbana in east central Illinois and at four remote field sites (DeKalb, Warren, Pike, and Pope Counties) where WCR problems in first-year corn had not been reported.

**Results**

Knowing geographically where WCR adults are present in soybean fields at only low densities has allowed entomologists to advise corn producers where soil insecticides or rootworm-resistant transgenic corn varieties are not needed to protect corn from larval injury by this pest. This has saved corn growers the expense of unneeded control measures. In addition, reduced insecticide applications are less harmful to non-target organisms and the environment.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
133	Pollution Prevention and Mitigation

**Outcome #4**

**1. Outcome Measures**

Knowledge Of Soil Composition

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	53

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

Maintaining natural soil productivity through proper management is important to crop producers and to keeping food costs to the consumer down.

**What has been done**

Participants in 10 soil and water workshops were provided with information on the following topics: 1) Illinois soils, 2) soils, the carbon cycle, and climate change, 3) recycling soil, 4) soils and the phosphorous cycle, and 5) soil and soil microbes.

**Results**

When asked after the workshop what they learned and what they plan to do as a result of the workshop, the most significant findings indicated an increased knowledge regarding soil recycling/reclamation, increased knowledge of healthy soil maintenance, and aspirations to increase soil testing and correct imbalances.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
133	Pollution Prevention and Mitigation

**Outcome #5****1. Outcome Measures**

Aspirations To Reduce Tillage In Crop Production

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	59

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

Reducing soil loss is essential to maintaining long-term agricultural productivity of the soil and to protecting water resources from sedimentation due to soil erosion.

**What has been done**

Tillage seminars (5) were conducted in February of 2007 with the largest attendance ever, due to personal invitations to Certified Crop Advisers.

**Results**

Based on a T-Transect survey conducted by the Illinois Department of Agriculture in 2006 to determine the tillage practices on all Illinois corn, soybean and small grain fields, no-till is now used to plant more acres than any of the other tillage systems in Illinois. In 1982 at the beginning of the 'T by 2000' program, just 59% of the cropland was at or below T. The 2006 survey showed that 85.8% of the points surveyed throughout Illinois were at or below the T or tolerable soil loss levels. Although Extension cannot make sole claim to this success, Extension natural resource programming has focused on reduced tillage practices since 1982 and will continue to help farmers make adjustments in management system to bring remaining acres to T or below.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
405	Drainage and Irrigation Systems and Facilities
112	Watershed Protection and Management

**Outcome #6****1. Outcome Measures**

Drainage Water Management System Acres

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	1000

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

In Illinois, drainage systems are normally laid out to minimize the cost of installation. However, such installations do not necessarily maximize the benefits of drainage water management.

**What has been done**

Existing drainage systems can be retrofitted for drainage water management by installing control structures at a cost of \$20 - \$40 per acre. For new systems additional costs are incurred by laying out the drainage systems to optimize the benefits of drainage water management.

**Results**

Drainage water management systems can be managed so that they store water during the growing season. This stored water can result in increased yields. A system that cost \$100/acre, for example, has a breakeven income of \$7.05. Thus, it does not take a large yield increase to pay for the installation of a drainage water management system.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Natural Disasters (drought, weather extremes, etc.)

**Brief Explanation**

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

**1. Evaluation Studies Planned**

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

**Evaluation Results**

**Key Items of Evaluation**

### Illinois RiverWater System

In June of 2007, the long-time Extension co-chair of the 2007 Governor's Conference on the Management of the Illinois River System challenged the 30+ members of the state conference planning committee to go back to their respective agencies and organizations and reflect on significant Illinois River programs which had been developed as a direct result of the eleven biennial Governor's Conferences on the Management of the Illinois River System held from 1987 – 2007. Responses elicited from these state and federal agencies and organizations provide the basis for a very impressive impact evaluation. They showcased tremendous long-term adoption and implementation of new conservation practices throughout the Illinois River Basin, development and passage of state and federal legislation for massive Illinois River watershed programs, and significant improvement in the environmental health and quality of the Illinois River and its watershed resources.

The foundations for the following programs can be directly attributed to successful interagency and multi-disciplinary cooperation, fostered at the Governor's Illinois River Conferences and subsequently implemented at the local, state and federal level:

Formation and operation of the Illinois River Coordinating Council.

Development of the Integrated Management Plan for the Illinois River System.

Illinois Conservation 2000 Programs conducted over 12 years with \$268 million invested in the programs.

Illinois River Conservation Reserve Enhancement Program, a \$500 million program, led by a former U.S. Congressman which currently has 123,000 acres presently enrolled.

Illinois Rivers 2020 Initiative, a \$2.5 billion program.

Development and funding for over twenty watershed restoration programs involving partnerships with 16 conservation organizations and governmental agencies.

Development/funding for low-cost Streambank Stabilization Methods on over 500 severely eroding stream bank sites in Illinois.

'Mud to Parks' Dredging and Re-Use of Sediment From the Illinois River. 75 barge loads of sediment were dredged from the Illinois River, barged up the Illinois River to Lake Michigan and used to convert a closed steel mill brownfield site in Chicago to a lakefront park.

Major riverfront development projects planned and constructed in numerous cities adjacent to the Illinois River from Grafton to Chicago involving hundreds of millions of dollars in improvements from public and private investments.

The National Scenic Byways Designation for Illinois River Roads by the U.S. Department of Transportation.

### Soil Tillage Systems

With respect to soil conservation through reduced tillage, a T-Transect Survey was conducted by the Illinois Department of Agriculture in 2006 to determine the tillage practices on all Illinois corn, soybean and small grain fields.

For the first time ever, no-till is now used to plant more acres than any of the other tillage systems (33.1% of the corn, soybean, and small grain acres no-tilled, 16.4% mulch tilled, 19.3% reduced-tilled, and 31.2% extensive tillage).

Soybean producers planted the majority of their soybean acreage, 51%, using no-till (another first).

Corn acres planted utilizing no-till and strip-till was also on the increase, up 2.1% from the previous year acreage of 14.9%.

Although Illinois farmers did not make the goal of T by 2000, tremendous progress has been made. In 1982 at the beginning of T by 2000, just 59% of the cropland was at or below T. The 2006 survey showed the 85.8% of the points surveyed throughout Illinois were at or below the T or tolerable soil loss levels. Although Extension cannot make sole claim to this success, the natural resource programming has focused on reduced tillage practices since 1982 and will continue to help farmers make adjustments in management system to bring remaining acres to T or below.

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

Human Nutrition, Diet Adequacy, Health and Wellbeing

**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 Cor	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%	
	<b>Total</b>	<b>100%</b>		<b>100%</b>	

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	10.0	0.0	5.0	0.0
<b>Actual</b>	35.4	0.0	6.6	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1504845	0	297501	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1286687	0	297501	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
9832431	0	1988662	0

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

A number of Extension programs focus on diabetes. "Dining with Diabetes" was taught as a three-part Extension program that combines lectures, food demonstrations, activities, and samples of healthy foods. In addition, a second three-part series, "Eating Well With Diabetes" is also offered. One time diabetes programs included "Eating to Reduce the Risk of Diabetes", "Diabetes and the Holidays", and related topics on awareness and managing diabetes. A bi-monthly newsletter "Diabetes Lifelines" was sent via mail to over 10,000 subscribers. Two websites also made information available to the public. The "Your Guide to Diet and Diabetes" site provided information to clientele on a variety of diabetes-related topics and is located at <http://www.urbanext.uiuc.edu/diabetes2> (nearly 20,000 "hits" per month). "Diabetes Recipes" provided additional recipes at <http://www.urbanext.uiuc.edu/diabetesrecipes/>. Currently, Extension educators are also assisting with research on hypoglycemia and soy intake.

Research activities include a study of the impact of eating cruciferous vegetables to reduce cancer risk, an evaluation of the absorption of health components from broccoli for maximum health benefits, work to develop a sustainable, functional dietary intervention strategy to reduce obesity and other related diseases such as insulin resistance and diabetes, and research designed to understand mechanisms of soy foods in colon cancer prevention. The CSREES Special Research Grant "Future Foods Initiative", which focuses on determining the effects of various soy components on health, wellness, and prevention and management of disease at various life stages, was funded by reallocated Hatch dollars in FY 2007.

## 2. Brief description of the target audience

Specific audiences include infants suffering from rotovirus infection, individuals with diabetes or who are primary caretakers of those with diabetes, 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(E). Planned Program (Outputs)

### 1. Standard output measures

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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	283000	600000	334000	400000
2007	611528	580665	115056	0

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

#### Patent Applications Submitted

Year	Target
Plan:	0
2007 :	1

#### Patents listed

Patent application number 11/546,770

### 3. Publications (Standard General Output Measure)

#### Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	14	14

## V(F). State Defined Outputs

### Output Target

**Output #1**

**Output Measure**

- Number of research publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	27	14

**Output #2**

**Output Measure**

- Number of completed research projects.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	5	5

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

O No.	Outcome Name
1	Number demonstrating or reporting KASA changes.
2	Number demonstrating or reporting behavior changes.
3	Determining The Impact Of Soy Formula And Its Components

**Outcome #1****1. Outcome Measures**

Number demonstrating or reporting KASA changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	407000	359

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

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.

**What has been done**

In the 2007 program year, over 700 adults attended the three program series of Dining with Diabetes classes. The programs have moved toward a menu-based program with each session focusing on healthy eating. Another 500 people were reached through one-time diabetes programs including 'Eating to Reduce the Risk of Diabetes', 'Diabetes and the Holidays', and related topics on awareness and managing diabetes. Another 500 people were reached through one-time diabetes programs including 'Eating to Reduce the Risk of Diabetes', 'Diabetes and the Holidays', and related topics on awareness and managing diabetes. Pre- and post-class questionnaires have been completed by participants.

**Results**

Overall, the mean knowledge of types of foods that affect glucose level post-test score was improved significantly ( $p < .001$ ) compared to the pre-test score. (359 individuals)

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
703	Nutrition Education and Behavior

**Outcome #2****1. Outcome Measures**

Number demonstrating or reporting behavior changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	10300	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)****What has been done****Results**

Data was not collected at this outcome level in 2007 for adults, but is included in the 4-H Youth Development planned program report.

**4. Associated Knowledge Areas**

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

**Outcome #3****1. Outcome Measures**

Determining The Impact Of Soy Formula And Its Components

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

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

Rotavirus (RV) in infants is the most common cause of severely dehydrating diarrhea. In the U.S., RV was responsible for 20 to 40 deaths, 55,000 hospitalizations and 500,000 physician visits in 2000. Currently, there is no safe vaccination available against rotavirus. Thus, the development of dietary means to prevent and/or reduce the severity of rotavirus infection would provide a safe and cost effective means to reduce infant morbidity.

**What has been done**

One promising candidate is soy protein and the flavonoid class compounds called isoflavones contained in soy. Preliminary work in our lab has shown that piglets fed formula with mixed isoflavones or genistein reduced the duration of diarrhea.

**Results**

Using a cell culture screening assay, all isoflavones at concentrations present in soy-based infant formulas were tested individually and as the complete mixture (MIX) for the ability to inhibit RV infectivity. We found that the MIX or genistin alone significantly reduced RV infectivity by 66-74% and 33-62%, respectively, compared with the control and across a wide range of RV concentrations. When tested without genistin, the MIX lost its anti-RV activity, suggesting that genistin is the biologically active isoflavone in our model. This was the first study showing the inhibition of RV infectivity by isoflavones present in soy infant formula. The modulation of SBIF isoflavone composition and concentration represents novel nutritional approaches to potentially reduce the severity of RV infection in human and production animals.

**4. Associated Knowledge Areas**

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

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Economy
- Competing Programatic Challenges

**Brief Explanation**

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

**1. Evaluation Studies Planned**

- Before-After (before and after program)

**Evaluation Results**

**Key Items of Evaluation**

**Program #6**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Food Product Development, Processing and Safety

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
501	New and Improved Food Processing Technologies	0%		35%	
502	New and Improved Food Products	0%		30%	
503	Quality Maintenance in Storing and Marketing Food Products	0%		10%	
702	Requirements and Function of Nutrients and Other Food Cor	0%		15%	
712	Protect Food from Contamination by Pathogenic Microorgani	100%		10%	
<b>Total</b>		100%		100%	

**V(C). Planned Program (Inputs)**

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	5.0	0.0	5.0	0.0
<b>Actual</b>	1.4	0.0	6.2	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
59514	0	302110	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
50886	0	302110	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
388853	0	2222029	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

University of Illinois Extension provides food safety training annually to employees of establishments that prepare or serve food. The five-hour Food Sanitation Refresher Course workshops helped 434 participants maintain their certification through this continuing education program and completion of a re-certification exam.

Another major area of Extension programming focused on food safety is targeted at teaching youth correct hand washing and cleanliness of areas when preparing food. Information is shared through presentations in pre-schools, schools, and 4-H materials and workshops.

Research activities included developing a MTS [manothermosonication] system that may provide a promising alternative for pasteurization of fruit and vegetable juices, work with dietary phytoestrogens with an emphasis on tumor growth, progression and metastasis, developing novel packaging materials to preserve the environment by decreasing the use of non-degradable synthetic packaging materials, identifying key odorants in foods to evaluate shelf-life or used to examine the effects of processing and storage on product quality, and the development of effective biobased films able to function as direct substitutes for traditional petroleum-based products.

**2. Brief description of the target audience**

Nutritionists and food scientists, youth, certified food handlers, soy processors, food manufacturers ranging from ingredient providers to packaging operations, food industry professionals, regulatory agencies, and food microbiologists.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

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

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	74000	151000	86000	100000
2007	3286	2220	3740	0

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

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
Plan:	0
2007 :	2

**Patents listed**

Patent applications 60/921,595 and 60/930,775

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

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	26	26

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of research publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	45	26

**Output #2**

**Output Measure**

- Number of completed research projects.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	5	3

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

O No.	Outcome Name
1	Number of people reporting or demonstrating KASA changes.
2	Number of people reporting or demonstrating practice changes including improved decision-making.
3	Beneficial And Adverse Effects Of Natural, Bioactive Dietary Chemicals On Human Health And Food Safety
4	Checking Thermometers For Accuracy, Posting Consumer Advisories For Undercooked Food, And Cooking And Reheating Protein Food To Correct End Temperatures
5	Percentage Increase In The Use Of Biodegradable Packaging Materials

**Outcome #1****1. Outcome Measures**

Number of people reporting or demonstrating KASA changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	124000	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

Data collected in this planned program is included under the added outcome indicator at the practice change level

**4. Associated Knowledge Areas**

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

**Outcome #2****1. Outcome Measures**

Number of people reporting or demonstrating practice changes including improved decision-making.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	13400	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

Data is reported under the more specific indicator that was added for this report.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
712	Protect Food from Contamination by Pathogenic Microorganisms, Pa

**Outcome #3****1. Outcome Measures**

Beneficial And Adverse Effects Of Natural, Bioactive Dietary Chemicals On Human Health And Food Safety

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

<b>Year</b>	<b>Quantitative Target</b>	<b>Actual</b>
2007	{No Data Entered}	0

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

Women are consuming dietary phytoestrogens as a natural and 'perceived' safe alternative to hormone replacement therapy. Interference with successful anti-hormone breast cancer therapies is a critical issue since estrogen-like dietary compounds can negate the effectiveness of these therapies.

**What has been done**

We have found that Genistein, in soy products, is a phytochemical with estrogenic activity. Our research has focused on the effects of dietary genistein on growth of estrogen (E)-dependent mammary tumors both in vitro and in vivo.

**Results**

These investigations are significant because this indicates that genistein can act as an estrogen agonist to stimulate E-dependent tumor growth and reverse the inhibitory effects of TAM and the aromatase inhibitor, Letrozole. This has significant implications for women with estrogen-dependent breast cancer being treated with aromatase inhibitors.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
702	Requirements and Function of Nutrients and Other Food Components

**Outcome #4****1. Outcome Measures**

Checking Thermometers For Accuracy, Posting Consumer Advisories For Undercooked Food, And Cooking And Reheating Protein Food To Correct End Temperatures

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	240

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

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.

**What has been done**

Workshops on food safety have been conducted statewide by Extension educators. Classroom presentations have been presented by professional and hourly staff to youth.

**Results**

Based on previous surveys, an estimated 240 participants in the Food Safety Refresher Course adopted one or more of some 29 food safety practices as a result of the University of Illinois Extension training. Most frequently mentioned were checking thermometers for accuracy, posting consumer advisories for undercooked food, and cooking and reheating protein food to correct end temperatures.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
503	Quality Maintenance in Storing and Marketing Food Products
712	Protect Food from Contamination by Pathogenic Microorganisms, Pa

**Outcome #5****1. Outcome Measures**

Percentage Increase In The Use Of Biodegradable Packaging Materials

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	5

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

Edible films and coatings are used to prevent quality loss due to moisture, oxygen, oil, and aroma/flavor migration of complex food systems. Edible films also have the potential to reduce packaging complexity, waste, and cost.

**What has been done**

In order to maximize the potential of a new technology, it is important to consider consumer concerns and acceptance. Therefore, a focus group study was conducted to understand consumer attitudes, opinions, and concerns toward edible film coatings.

**Results**

Four independent focus groups (n=27) were conducted with each group consisting of 5 to 8 consumers who are frequent grocery shoppers. Consumers were concerned about the types of products that are coated, safety of the coating materials, sensory qualities of the resulting products, end benefits of EFC and the cost of the food products packaged with EFC.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
502	New and Improved Food Products

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Economy
- Competing Public priorities

**Brief Explanation**

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

**1. Evaluation Studies Planned**

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

**Evaluation Results**

**Key Items of Evaluation**

**Program #7****V(A). Planned Program (Summary)****1. Name of the Planned Program**

Agricultural and Consumer Economics

**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%	
	<b>Total</b>	<b>100%</b>		<b>100%</b>	

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	13.0	0.0	12.0	0.0
<b>Actual</b>	7.0	0.0	23.4	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
297568	0	796850	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
254430	0	796850	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1944266	0	4297822	0

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

University of Illinois Extension conducted home buyer education single session or multi-week seminars partnering with various groups to sponsor or teach a portion of the programs. These partners included the Illinois Housing Authority Family Self-Sufficiency Program, financial institutions, consumer credit counseling groups, realtors and home inspectors, city police departments, and community development departments. Topics included solving credit problems to become credit-worthy, qualifying for first-time homeowner financing and mortgage loans, choosing homeowners insurance, and developing a homeowner expense budget. A total of 89 participated in the program this year and received the required certificate of completion.

University of Illinois Extension partnered with the United States Department of Justice (USDOJ) to offer a personal financial management course for debtors under the new bankruptcy legislation. The Extension program Personal Finances: Charting a New Course covered the four mandatory consumer education topics in the new legislation: budgeting, credit, identity theft, and consumer resources. Classes were offered in thirteen locations in the Northern, Central, and Southern bankruptcy districts in Illinois. Additionally, two locations in Chicago were chosen as pilot sites for the USDOJ's curriculum. These sites garnered full classes and a working partnership with the USDOJ in Washington, DC. There were 314 participants who completed evaluations.

Other Extension activities directed at consumers focused on fraud, consumer health care options, credit, planning ahead for retirement, and workforce preparation. The activities involved direct teaching as well as web site delivery.

Extension activities related to agricultural economics included Farm Income 2006 Workshops, Annie's Project, a series of sessions to educate women (and men) in five areas of production agricultural risk management, Andy's Project, focused on basic computer skills for agricultural producers, estate planning workshops, and farmland leasing presentations.

Activities also included research on legal issues related to biotechnology and intellectual property rights, presentations to the Illinois Bar Association, American Bar Association, and American Agricultural Law Association, participation in the NC-1014 Multistate Committee, development of a unique [only one in the world] course on agro-industrial marketing taught to Executive MBA students in Argentina, contributions to several revised decision-making tools on Farmdoc [the goal of Farmdoc is to improve farm decision-making under risk through education and research], and research on small public water supply systems that has fostered collaborations with the U.S. EPA, Natural Resources Defense Council, and the Waterkeeper Alliance.

**2. Brief description of the target audience**

Members of the target audience include USDA Rural Development clients [completion of a home-buying education course is mandated for USDA rural development clients; likewise, some Illinois cities and lending institutions mandate completion of home-buying education], residents of public housing, low-income individuals, first-time home buyers, individuals filing for federal bankruptcy, agricultural producers, practicing and academic lawyers, processors, retail distributors of natural and organic products, agriculture biotechnology firms, farm credit institutions, 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(E). Planned Program (Outputs)**

**1. Standard output measures**

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

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	4060	2000000	1250	750
2007	25585	49588	5733	0

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

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	0
2007 :	0

**Patents listed**

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

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	3	44	47

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of research publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	45	44

**Output #2**

**Output Measure**

- Number of completed research projects.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	5	1

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

O No.	Outcome Name
1	Participants will report/demonstrate KASA changes.
2	Participants will report/demonstrate practice changes including improved decision-making.
3	Page and File Requests made to Farmdoc

**Outcome #1****1. Outcome Measures**

Participants will report/demonstrate KASA changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	5700	336

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

Meeting government requirements for home buying and bankruptcy

**What has been done**

Conducting classes for 89 low income home buyers and 314 debtors.

**Results**

Indicators include:

Knowledge of planning for the expenses of home ownership. (34) (Low income home buyers classes)

Knowledge related to ability to improve financial behavior has increased. (304) (Debtors classes)

Knowledge that individual's ability to get a job, purchase a home, and obtain home and auto insurance can be affected by credit reports. (Debtors classes)

Knowledge that a debt-to-income ratio of more than 20% may indicate that a person has borrowed too much relative to their income. (Debtors classes)

Aspiration to review bills monthly for accuracy. (Debtors classes)

Aspiration to compare prices before making purchases. (Debtors classes)

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
801	Individual and Family Resource Management

**Outcome #2****1. Outcome Measures**

Participants will report/demonstrate practice changes including improved decision-making.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	1375	122

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

Home buyers, especially low income home buyers, face the potential for foreclosure if they lack the financial knowledge to manage housing costs.

**What has been done**

Practice Change: Successful purchase of a home (122)

**Results**

To date only one foreclosure has been reported by those who have successfully completed the homebuying workshop in Rockford, Illinois of those who attended and purchased a home since 1996.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
801	Individual and Family Resource Management

**Outcome #3****1. Outcome Measures**

Page and File Requests made to Farmdoc

**2. Associated Institution Types**

- 1862 Extension
- 1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	190000

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

Successful risk management strategies depend on accurate characterization of the uncertainties being faced. Of primary importance for crop farmers is revenue variability arising from uncertain crop yields and prices. In response to the difficulty in managing this risk, the Federal government has developed numerous crop yield and revenue insurance products, and has provided incentives to purchase crop insurance by subsidizing insurance premiums. However, attempts to better understand participation, loss rating, and improve product design and participation have been hampered by uncertainty about the most appropriate characterization of farm-level yield and revenue distributions. This project seeks to fill that gap by developing a robust means to condition yield and price distributions that can be accurately and readily estimated using NASS and FBFM data on variables that are readily available to the farmer reflecting their management and cropping practices and structural characteristics.

**What has been done**

Farmdoc is a website containing online crop insurance tools including a premium calculator for crop insurance products and a decision tool that computes payoffs and risk statistics for representative farms in each of the counties in Illinois, Indiana, and Iowa. The results can be implemented in a very useable model by both farmers and crop insurance agents to further customize their risk assessments and improve crop insurance decisions. Crop insurance decisions were the major focus of activities for the last year. The highly popular premium calculator that estimates the premiums of crop insurance products for corn, soybeans, wheat, and grain sorghum in the North Central Region was revised and made available for 2007 crop insurance decisions. The calculator included premiums for basic, optional and enterprise units. In addition, a decision-tool that computes payoffs and risk statistics for representative farms in each of the counties in Illinois, Indiana, and Iowa was updated for 2007 crop insurance decisions. A total of 192,504 page and file requests were made to these tools during 2007. Clearly, by any standard, large numbers of producers, educators and agribusinesses found these tools of considerable value.

**Results**

This project is substantially improving scientific knowledge about risk modeling and evaluation for crop farms in Illinois and throughout the cornbelt. The incorporation of this information into enhanced models provides farmers with an important tool to use in evaluating specific farm risk management strategies. The demand for this type of tool is well established, and is being met through delivery channels that are well-suited for the proposed research information and tools. In total, this project provides highly valuable information and modeling tools to evaluate available risk management alternatives for crop farmers in an effective, useable, and timely form.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
602	Business Management, Finance, and Taxation

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Economy

**Brief Explanation****V(I). Planned Program (Evaluation Studies and Data Collection)****1. Evaluation Studies Planned**

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

**Evaluation Results****Key Items of Evaluation**

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

Animal Genomics

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

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
303	Genetic Improvement of Animals	0%		50%	
304	Animal Genome	0%		50%	
	<b>Total</b>	0%		100%	

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.2	0.0	5.0	0.0
<b>Actual</b>	0.0	0.0	2.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
0	0	194576	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	194576	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	523352	0

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

Activities include continuing to sequence the porcine genome, developing statistical and bioinformatics tools that provide accurate and precise results, thus supporting the effective application of genomics and proteomics information to the improvement of U.S. agriculture, the completion of a diagnostic test for Tibial Hemimelia that has been commercially licensed and performed on more than 16,000 animals since late 2005, work to identify genetic regions that influence the production and quality of pork, and research to establish which genes in the bovine mammary gland are involved in milk fat synthesis regulation to improve nutrient utilization and profitability of dairy farming. The CSREES Special Research Grant focused on sequencing the porcine genome was funded by reallocated Hatch dollars in FY 2007.

**2. Brief description of the target audience**

The target audience consists of the international animal genomics community, with work being done in several U.S. sites [Nevada, Illinois, Nebraska, Iowa] and several international sites [United Kingdom, France, Scotland].

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

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

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	500	5000	0	0
2007	0	0	0	0

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

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	0
2007 :	0

**Patents listed**

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

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	6	6

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of research publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	49	6

**Output #2**

**Output Measure**

- Number of completed research projects.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	8	4

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O No.	Outcome Name
1	Percent of sequence in 3x coverage of the Porcine Genome and deposit it in a public database

**Outcome #1****1. Outcome Measures**

Percent of sequence in 3x coverage of the Porcine Genome and deposit it in a public database

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	50	20

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

Domestic pigs have a long historical and economic association with human cultures. Consequently, pigs are abundant and represent many different breeds that can be considered as biological equivalents to human ethnic and racial groups. Many pedigrees of pigs are available for research supported by phenotypic measurements and DNA is widely available from these pedigrees. Additional genetic diversity has been created in interspecies crosses such as domestic x exotic breeds to produce high-density comparative genetic maps between pigs and humans. The pig genome is of similar size, complexity, and chromosomal organization as the human genome. The porcine genome is now uniquely positioned for sequencing as a result of the development of these necessary tools and reagents.

**What has been done**

Our research generates 3X whole-genome coverage by sequencing BAC contigs. Our approach is designed to mitigate problems associated with prior and current shotgun sequencing projects and makes effective use of the size and diversity of our user population. This project was developed to address not only the sequencing strategy of a BAC MTP but also to provide an integrated approach for assembly and annotation.

**Results**

We are committed to creating a program that supports the rapid deployment of the information and how to use the generated sequence information. The data from the project will be made immediately available to researchers worldwide at [http://www.sanger.ac.uk/Projects/S\\_scrofa/](http://www.sanger.ac.uk/Projects/S_scrofa/).

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
304	Animal Genome
303	Genetic Improvement of Animals

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Other (Changes In Instrumentation)

**Brief Explanation**

Sequencing has been delayed in part because The Sanger Institute is retooling and increasing instrumentation and the investigators have chosen to continue to utilize the original equipment because of their high level of confidence in it. The project has been extended to 2009.

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

- Other (Please see explanation below.)

**Evaluation Results**

Sequencing data will be made available to the research community, allowing them to evaluate and build on our results.

**Key Items of Evaluation**

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

Biofuels

**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%	
	<b>Total</b>	100%		100%	

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	0.2	0.0	3.0	0.0
<b>Actual</b>	1.2	0.0	2.2	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
51012	0	69602	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
43617	0	69602	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
333303	0	679489	0

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

Research activities support by Hatch funds include work to characterize biodiesel fuel and its properties in order to be able to analyze its effects on combustion and emissions, process development studies for dry grind ethanol processes, efforts to optimize the dry grind ethanol fermentation process, an investigation of the use of the elusieve [a combination of sieving and elutriation] process to decrease coproduct value while also decreasing costs, and the development of a mass-balance based spreadsheet model for dry grind ethanol economics.

**2. Brief description of the target 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(E). Planned Program (Outputs)**

**1. Standard output measures**

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

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	0	0	0	0
2007	1240	300	335	0

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

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	1
2007 :	0

**Patents listed**

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

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	12	12

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of research publications

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	15	12

**Output #2**

**Output Measure**

- Number of completed research projects.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	2	1

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

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 Measures**

Proportion of the Use of Biomass Relative to Total Energy [Currently at 3-4%]

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	4	4

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

Alternative energy sources play an important role in supporting national economic growth, national energy policy, and increasingly important environmental goals.

**What has been done**

Fuels derived from cellulosic biomass [the fibrous, woody and generally inedible portions of plant matter] offer an alternative to conventional energy sources.

**Results**

The percentages and projections on the proportional use of biomass relative to total energy are consistent with the literature. One of the bottlenecks appears to be the deconstruction technology and scale-up. In a decade or so, it is anticipated that these percentages would increase exponentially, consistent with solving the bottlenecks.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
402	Engineering Systems and Equipment
601	Economics of Agricultural Production and Farm Management
201	Plant Genome, Genetics, and Genetic Mechanisms

**Outcome #2****1. Outcome Measures**

Percent reduction in NOx Emissions from Biodiesel

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	15	15

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

To evaluate the use of biomass-derived fuels in off-road vehicles in terms of engine performance, durability, and emissions.

**What has been done**

Beyond 2011, efforts will be focused on being able to achieve the 2011 level of reduction under a broader set of conditions, e.g. different engine technologies, different biodiesel feedstocks, different operational conditions.

**Results**

Our research has found that the previously given estimate for 2007 is accurate and that estimates given for 2008 and 2009 are well within expectations.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
402	Engineering Systems and Equipment

**Outcome #3****1. Outcome Measures**

Improvement in the Biomass Yields of Perennial Grasses for Cellulosic Ethanol Relative to Current Maximum Switchgrass Yields

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Condition Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	30

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

Energy production is expected to increasingly rely on dedicated bioenergy crops.

**What has been done**

The goal is to identify crops with a high positive energy balance [the ability to convert solar energy into biomass with minimal inputs]. We have focused on comparing two crops, Miscanthus and switchgrass.

**Results**

Given that we have already established that miscanthus yields are twice that of switchgrass our original estimates are conservative.

**4. Associated Knowledge Areas**

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

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Economy

**Brief Explanation****V(I). Planned Program (Evaluation Studies and Data Collection)****1. Evaluation Studies Planned**

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

### **Evaluation Results**

### **Key Items of Evaluation**

**Program #10**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Human Development and Family Wellbeing

**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%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	9.0	0.0	3.0	0.0
<b>Actual</b>	14.6	0.0	8.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
620642	0	195676	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
530668	0	195676	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
4055183	0	1699066	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Research on family resiliency was conducted within the department of Human and Community Development as well as jointly with other units on campus. Extension educators continued to employ multiple approaches to reach families and family members including personal contact, workshops, meetings, newsletters, and web sites.

Parenting 24/7 is a web-based resource that serves as a “one-stop” repository for parenting information that is produced by the University of Illinois Family Life team. The site is organized by age of children, and includes research based articles, links to breaking news on child development, parenting, and family life, links to recommended websites, and video clips of actual parents talking about how they manage the challenges of raising children. The site also features: 1) the ability to receive monthly updates on new content added to the site, 2) the ability to rate and make comments on all content, and 3) the ability to easily share content by emailing to others or printed materials. The program is marketed by Extension offices using promotional materials developed by the Family Life Team of Extension Educators.

Intentional Harmony is a multidimensional curriculum that helps adults manage the challenges of contemporary working life. The program is unique in that it is research-based, addresses the critical domains of personal life, offers extended support, and incorporates outcome evaluation. The content is delivered face-to-face and through conventional written materials, but has a significant mechanism for curriculum updates and facilitator support via a dynamic website. Six modules correspond to managing work and six domains of non-work life that include: 1) parenting, 2) relationships with a partner or spouse, 3) workplace relationships/stress, 4) emotional well-being, 5) physical health, and 6) extended family and friends. A web-based self-study for end users is being developed. Intentional Harmony is being used by facilitators across the country. Workshops for “Intentional Harmony: Managing Work and Relationships” were presented to over 800 attendees. Work is also being done with the National Extension Marriage Couples Education Network to develop a National Extension Marriage and Couples Education Model.

We extended a line of action-oriented research that examines the effectiveness of methods developed for improving sibling relationships among young children and the factors that predict more positive sibling interactions. Work continues in the expansion of the Child Development Laboratory Research Database. Research was conducted to identify the coping strategies of families that allow them to overcome the stressors associated with low-resource, high-risk neighborhoods, as well as those family factors that enhance families' vulnerability. Due to overwhelming demand a second Illinois Rainbow Families Conference was held in 2007 [targeting the needs of gay/lesbian parents in downstate Illinois]. Presentations have been made under this planned program to the National Council on Family Relations, the NICHD Transition to Fatherhood Research Network, the National Council on Black Studies, the XVth Biennial International Conference on Infant Studies, and the Biennial Meeting of the Society for Research in Child Development.

**2. Brief description of the target audience**

Families (in all their variations), family members and those working with families such as physicians and child care providers, parents and professionals who work with parents, and individuals who work for pay, inside or outside their homes.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

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

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	14500	247000	2100	1000
2007	28137	22569	12167	0

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

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
<b>Plan:</b>	0
2007 :	0

**Patents listed**

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

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	1	8	9

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of research publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	7	8

**Output #2**

**Output Measure**

- Number of completed research projects.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	3	0

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

O No.	Outcome Name
1	Number of persons demonstrating or reporting KASA changes.
2	Number of persons reporting or demonstrating behavior changes.
3	Number Of Research Projects Utilizing The Child Development Laboratory Research Database

**Outcome #1****1. Outcome Measures**

Number of persons demonstrating or reporting KASA changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	10800	585

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

Attendance at traditional face-to-face parent education programs has been decreasing over time. Contemporary families that have two working parents and busy lifestyles have less time to commit to educational opportunities. At the same time, parents continue to express the need for information on parenting and child development that will help them solve common child rearing challenges. Surveys on the information needs of parents show that parenting workshops are among the least preferred ways of receiving information. These surveys show that parents prefer receiving information in a way that is convenient for them.

**What has been done**

The Parenting 24/7 website provides information that can be accessed at any time of the day. Users are able to subscribe to 'just-in-time' parenting newsletters that have been shown to be effective in promoting positive parenting. Moreover, research-based articles are complemented by video clips of actual parents talking about their child rearing challenges and how they deal with these challenges. Altogether, the site reinforces the notion that although parents can learn about their children's development and develop new parenting strategies, there are many 'right ways to parent'.

**Results**

In this report four indicators of success are documented: (1) Use of the site has steadily increased over time, (2) parents rate the site as being useful, and attribute changes in knowledge, attitudes, and practices to the information provided by the site, (3) outside organizations have requested permission to reprint articles, and (4) the project has been able to be self-sustaining, and has contributed to funding for additional programming.

**4. Associated Knowledge Areas**

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

**Outcome #2****1. Outcome Measures**

Number of persons reporting or demonstrating behavior changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	3600	663

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The majority of Americans increasingly find themselves called upon to manage out-of-the-home work and the needs of personal and family life. Work-life stress can have serious effects on emotional and physical well-being and on relationships with family members. At work, stress leads to increased dissatisfaction and absenteeism, low productivity, conflict with co-workers, worker turnover, and higher health insurance costs. Although commercial work-life materials exist, these can be costly, are often not research-based, and frequently address only small parts of the problem.

**What has been done**

A formative evaluation of one Intentional Harmony module: Managing Work and Parenting was conducted. The design included a control group that did not receive the workshop. The pre and post test addressed seven indicators of success. There were 76 participants in the workshop who completed the pre and post tests and 34 in the control group.

**Results**

The report documents seven indicators of program success. In each workshop, parents but not control group parents showed statistically significant improvement from pre-workshop to post-workshop evaluations: (1) attention to roles, (2) behavior conflict and spillover, (3) parenting practices, (4) overload and time conflicts, (5) organizational skills, (6) physical strain, and (7) emotional strain.

**4. Associated Knowledge Areas**

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

**Outcome #3**

**1. Outcome Measures**

Number Of Research Projects Utilizing The Child Development Laboratory Research Database

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	18

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

The Database is a resource designed to facilitate an interdisciplinary, longitudinal, and programmatic research agenda at the Child Development Laboratory in the areas of child development and family studies.

**What has been done**

During the initial year of the project newly created baseline assessment procedures were developed for assessing cognitive and socioemotional developmental domains of children enrolled in the CDL program. The CDL Research Database was revised to take into account the new focus of these baseline assessment protocols. This information has then been made available to researchers collecting data with CDL children and staff for research projects.

**Results**

There are three beneficiaries of this project. First, the systematic procedures used to create this unique database of information on children's behavior across multiple developmental domains allows researchers to use this data for both historical and projective analyses that focus on child development and outcomes resulting from interactions in high quality early childhood environments. Second, the continuation of the CDL Research Database Project facilitates long-term, interdepartmental and cross-departmental faculty and student collaborations that provide opportunities for creative investigations of children's development. Finally, children and families throughout Illinois and the U.S. have benefited from the knowledge being generated through research projects being conducted as part of this project.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
802	Human Development and Family Well-Being

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Economy

**Brief Explanation****V(I). Planned Program (Evaluation Studies and Data Collection)****1. Evaluation Studies Planned**

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

**Evaluation Results**

A formative evaluation of one (of six) Intentional Harmony modules: Managing Work and Parenting was conducted. The design included a control group that did not receive the workshop. The pre and post test addressed seven indicators of success. There were 76 participants in the workshop who completed the pre and post tests and 34 in the control group. In each workshop, parents but not control parents showed statistically significant improvement from pre-workshop to post-workshop evaluations in seven areas: 1) attention to roles, 2) behavior conflict and spillover, 3) parenting practices, 4) overload and time conflicts, 5) organizational skills, 6) physical strain, and 7) emotional strain.

**Key Items of Evaluation**

Parenting 24/7 is a web-based resource that serves as a one-stop repository for parenting information that is produced by the University of Illinois Family Life team that includes research-based articles, links to breaking news on child development, parenting, and family life, links to recommended websites sites, and video clips of actual parents talking about how they manage the challenges of raising children.

Impact evaluation focuses on documenting four indicators of success: 1) steady increases in use by clientele, 2) information from users that demonstrate the site's value as a source of parenting information, 3) requests for permission to reprint articles, and 4) the project's ability to be self-sustaining, and its value in leveraging funding for additional programming. The user survey was completed in November 2006, with web statistics updated in February 2007.

1) Use of the Parenting 24/7 Site has Increased over Time:

Since being launched in September 2005, the site has shown steady growth in use. The page views have grown from 4,574 in September 2005 to 32,590 in October of 2007. Users have accessed the site from over 56 different countries.

2) User Survey Demonstrates the Value of the Site:

Invitations to participate in an online survey were sent by email to 265 registered users of the site. Of the 231 that still had valid email addresses, 68 (27%) completed the survey. The users were a mix of parents and professionals. When asked to rate the overall usefulness of the Parenting 24/7 Website, most (75%) rated it as being 'very useful' and the remainder (24.5%) rated it as 'somewhat useful'. The Parenting 24/7 website was generally rated as being better than other University of Illinois Extension parenting websites in terms of its design, ease of use, and quality of content. Most importantly, parents reported that the content on the site had enhanced their parenting knowledge and abilities. Specifically, 75% learned useful parenting practices or strategies, 63% learned ways to cope with the stresses of parenting, and 70% learned ways to manage some of the challenges of family life. In addition, 67% felt less worried or anxious about their child's development and 60% feel more confident in their skills as a parent.

3) Parenting 24/7 Articles are Valued by Professionals:

The Parenting 24/7 project routinely receives requests for reprinting articles, often for international use. Parenting 24/7 articles are also being reprinted for distribution in locally distributed parenting newsletters in other states. References to articles or links to the site have also appeared in a variety of sources from across the country.

4) The Parenting 24/7 Website Has Led To Funding for Other Related Projects:

Illinois' experience in establishing and maintaining the Parenting 24/7 website was an important factor in being awarded a \$125,000 contract to lead the eXtension collaborative project that will result in an electronically delivered 'just-in-time' parenting newsletter focused on the first year of life. Finally, the Parenting 24/7 website will be a major program component for a new community-based University of Illinois Extension program to promote positive parenting and healthy relationships between parents as a part of the five-year USDA Children Youth and Families at Risk program.

**Program #11****V(A). Planned Program (Summary)****1. Name of the Planned Program**

4-H Youth Development

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

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
724	Healthy Lifestyle	5%		0%	
806	Youth Development	95%		0%	
	<b>Total</b>	100%		0%	

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	75.0	0.0	3.0	0.0
<b>Actual</b>	57.1	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2427307	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2075419	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
15859655	0	0	0

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

4-H Youth Development offers a variety of educational delivery systems to help youth develop into adults who contribute in positive ways to their families and communities. Delivery methods included community clubs, after-school programs, teacher training, conferences, and camps. The current curriculum includes science, engineering, and technology (SET), healthy lifestyles, and youth leadership, the three national areas of focus. In addition, social emotional learning, character education, and healthy relationships received attention through interdisciplinary efforts between Extension youth development staff and other Extension staff efforts to develop education in these areas. Examples follow:

Get Up & Move

Get Up & Move is a series of lessons that focus on nutrition and physical activity designed to be used with groups. The program was created as an optional educational monthly program activity for 4-H clubs, and each lesson includes experiential educational activities, nutritional snack recipes that can be used for after meeting refreshments, and recreational activities that involve lots of physical activity. The goal of the series is to increase the number of minutes spent in physical activity and to encourage youth participants to choose healthy snacks. Illinois enrollment data indicates that 486 youth were enrolled in the Get Up & Move program this past year.

Health Jam involved University of Illinois Extension working in collaboration with community partners to conduct a nine-week program to promote healthy lifestyles and health professions career education to elementary-age youth through an experiential approach to learning.

Promoting Life Skills to Prevent Violence reached middle and high school youth by implementing school-wide character education and a service learning curricula with training provided by Extension staff to teachers who implemented the program.

Volunteer Training included an orientation series of six one-hour modules for new volunteers and sessions on child protection, behavior management, and overall risk management.

Extension's State 4-H Office and the Graduate School of Library and Informational Science are collaborating to develop a youth community informatics curriculum: interactive web-based modules on computer refurbishing, computer networking, podcasting, multimedia design, game design, and library resources. In year one of the grant, five graduate students are helping to develop the curriculum through collaborative informatics projects with youth in several Illinois communities. Research projects related to youth development are included in the Human Development Planned Program.

**2. Brief description of the target audience**

Youth, youth leaders (paid and volunteer), parents, and community members.

**V(E). Planned Program (Outputs)**

**1. Standard output measures**

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

	<b>Direct Contacts Adults</b>	<b>Indirect Contacts Adults</b>	<b>Direct Contacts Youth</b>	<b>Indirect Contacts Youth</b>
<b>Year</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>	<b>Target</b>
<b>Plan</b>	8900	0	107000	0
2007	207200	0	539451	191169

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

**Patent Applications Submitted**

<b>Year</b>	<b>Target</b>
Plan:	0
2007 :	0

**Patents listed**

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

**Number of Peer Reviewed Publications**

	<b>Extension</b>	<b>Research</b>	<b>Total</b>
<b>Plan</b>			
2007	0	0	0

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	7	0

**Output #2**

**Output Measure**

- Number of completed research projects.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	3	0

**V(G). State Defined Outcomes**

**V. State Defined Outcomes Table of Content**

O No.	Outcome Name
1	Number demonstrating or reporting KASA changes.
2	Number demonstrating or reporting behavior changes.

**Outcome #1****1. Outcome Measures**

Number demonstrating or reporting KASA changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	87000	698

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

Volunteers need to recognize how to create a safe and structured environment for youth activities as well as creating a positive caring relationship with youth.

**What has been done**

A variety of volunteer training was conducted for 4-H volunteers. Keeping Youth Safe was taught by Extension staff to 198 volunteers. Planning 4-H Club/Group Guidelines Together and Techniques for Cooperation sessions were conducted for 110 volunteers. 100 volunteers attended training on risk management and 105 volunteers participated in the Valued Volunteer Orientation series that included face-to-face and distance training on the role of the 4-H volunteer, club organization, program planning, positive youth development, communications within a 4-H club, and experiential learning.

**Results**

Both after training and follow-up evaluation instruments were developed and used state-wide for each of 10 training topics. Information gathered from volunteer participants at the end of the training indicated (through quantitative measures) knowledge gained in one of the following specific areas: 1) recognition of child abuse, 2) increased knowledge of strategies to manage risk in planning events, and 3) increased knowledge of setting guidelines with club/group. In response to a specific follow-up evaluation, a few volunteers indicated the adoption of developing a yearly club program plan and tried new ways of communicating with club members (email, text messaging, newsletters, phone calls).

In response to an open-ended question to participants in the volunteer orientation, important knowledge gains are not quantified but included delegating to others and various resources they planned or had used with their 4-H club such as sample questions for the various stages of the experiential learning cycle.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
806	Youth Development
724	Healthy Lifestyle

**Outcome #2****1. Outcome Measures**

Number demonstrating or reporting behavior changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	58000	0

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

**What has been done**

**Results**

All results are reported in the newly created outcome measure.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
806	Youth Development
724	Healthy Lifestyle

**V(H). Planned Program (External Factors)**

**External factors which affected outcomes**

- Competing Programatic Challenges

**Brief Explanation**

Staff over estimated the scope of impacts, and general outcome indicators are being replaced by more specific ones.

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

**1. Evaluation Studies Planned**

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

**Evaluation Results**

Unhealthy lifestyles are not limited to the youth of Illinois. This is a serious health concern for many states that have rising levels of childhood obesity, diabetes, and lack of physical exercise, all of which contribute to chronic health problems.

University of Illinois Extension formed a collaborative partnership with the following groups: National Center for Rural Health Professions, a local hospital, University of Illinois College of Medicine at Rockford, and Archer, Daniels, Midland Company to deliver Health Jam. Approximately 90 youth participated in this two-day camp that immerses youth in physical activity, experiential study of body systems, and exploration of health careers. The youth also participated in an eight-week "Walk Across Illinois." At the end of eight weeks, each team had "walked" 448 miles. Participants kept a daily log of exercise, met weekly to chart progress on the walk, and participated in Get Up and Move activities.

#### Impact Results

Students completed the School Health Education Evaluation (SHEE) test before and after Health Jam. A statistical analysis of test data concluded there was a statistically significant ( $p < .05$ ) difference in the pre and post SHEE scores, indicating a significantly high impact on knowledge, attitudes, and behaviors concerning healthy lifestyles.

Students completed a pre/post test to evaluate gains in content knowledge. The statistical analysis showed that Health Jam made a significant difference ( $p < .01$ ) on the student's knowledge about health careers and a significant difference ( $p < .05$ ) on their knowledge of body systems.

At the end of eight weeks, 100% of the students had completed or exceeded the goal of 30 minutes of daily physical activity to complete the Walk Across Illinois.

#### Key Items of Evaluation

**Program #12**

**V(A). Planned Program (Summary)**

**1. Name of the Planned Program**

Agricultural and Biological Engineering

**V(B). Program Knowledge Area(s)**

**1. Program Knowledge Areas and Percentage**

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
112	Watershed Protection and Management	0%		10%	
401	Structures, Facilities, and General Purpose Farm Supplies	8%		15%	
402	Engineering Systems and Equipment	0%		35%	
403	Waste Disposal, Recycling, and Reuse	42%		10%	
404	Instrumentation and Control Systems	17%		25%	
405	Drainage and Irrigation Systems and Facilities	8%		5%	
511	New and Improved Non-Food Products and Processes	25%		0%	
	<b>Total</b>	100%		100%	

**V(C). Planned Program (Inputs)**

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

Year: 2007	Extension		Research	
	1862	1890	1862	1890
<b>Plan</b>	1.4	0.0	6.0	0.0
<b>Actual</b>	4.4	0.0	5.4	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
187043	0	202971	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
159927	0	202971	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1222110	0	1792843	0

**V(D). Planned Program (Activity)**

**1. Brief description of the Activity**

Activities include a multistate project regarding aerial application of foliar fungicides for protection of corn from plant disease conducted in Illinois, Arkansas, and Kansas, installation of subsurface bio-reactors in an attempt to provide a subsurface solution to a subsurface problem, efforts focused on creating an innovative concept of visual situation awareness technology for mobile agricultural machinery, a \$2 million grant received from the Energy Biosciences Institute [in the area of biomass feedstock production], a vision-based imaging system combined with new lighting developed for liquid spray and other particle size measurement, presentations at the annual meetings of the Institute of Biological Engineering and the American Society for Agricultural and Biological Engineers, a study of how factors such as types of ventilation system, level of ventilation rate, and location of pollutant source affect air quality [in conjunction with the NE-1022 group], and development of a web-based instructional component for a graduate education program in Technical Systems Management.

Extension activities have a heavy focus on manure management and air quality, particularly radon detection. These activities include state wide Certified Livestock Management workshops and an online five-part quiz series that meets the state requirements for training and certification for livestock producers. New workshop content now includes concrete construction, carcass disposal, the latest odor control research, manure sampling, marketing manure based on the value of manure as fertilizer, and feeding ethanol by-products and how they affect the manure management plan.

The Healthy Homes Partnership is a multi-state program with funding from USDA/CSREES. Illinois continues to be involved in radon education and home energy conservation with an emphasis on healthy indoor air. An interdisciplinary team of Extension staff continued to partner with the Illinois Emergency Management Agency (IEMA) to make presentations, distribute literature, and promote availability of free radon detection kits from the IEMA Management Agency and the Take Action On Radon informational website co-developed by IEMA and Extension to homeowners, renters, housing professionals, realtors, and contractors.

## 2. Brief description of the target 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], and agricultural engineers. Additional Extension target audiences include livestock producers, homeowners, renters, housing professionals, realtors, and contractors.

## V(E). Planned Program (Outputs)

### 1. Standard output measures

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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	5500	3000	500	200
2007	6414	4571	3961	0

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

#### Patent Applications Submitted

Year	Target
Plan:	1
2007 :	2

#### Patents listed

Two patent applications were submitted, numbers 60/843,852 and 11/851,205.

### 3. Publications (Standard General Output Measure)

#### Number of Peer Reviewed Publications

	Extension	Research	Total
Plan			
2007	0	24	24

**V(F). State Defined Outputs**

**Output Target**

**Output #1**

**Output Measure**

- Number of completed research projects.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	9	2

**Output #2**

**Output Measure**

- Number of research publications.

<b>Year</b>	<b>Target</b>	<b>Actual</b>
2007	60	25

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

O No.	Outcome Name
1	Number reporting or demonstrating KASA changes.
2	Number demonstrating or reporting practice changes.
3	Number Of Subsurface Bioreactor Acres In Illinois
4	Improved Utilization Of Mechanized Precision Farming
5	Installation Of Home Radon Mitigation Systems Or Removal Of Mold In Homes

**Outcome #1****1. Outcome Measures**

Number reporting or demonstrating KASA changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Knowledge Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	3500	0

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

Data was collected on this Outcome Indicator, as well as data regarding practice changes. As instructed the data is only being included in the higher level--practice changes.

**Results****4. Associated Knowledge Areas**

KA Code	Knowledge Area
402	Engineering Systems and Equipment

**Outcome #2****1. Outcome Measures**

Number demonstrating or reporting practice changes.

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	2800	60

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

Air and surface water contamination can result from improper livestock manure handling.

**What has been done**

Since implementation 10 years ago of livestock manure management regulations that include required training and certification testing, Extension has been conducting a workshop and an online quiz series to address the regulations administered by the Illinois Department of Agriculture.

**Results**

A follow up of certified livestock manager workshop attendees in 2003 found that the practice changes most frequently implemented indicated that 8% increase the frequency of manure testing, 16.7% now regularly notified neighbors prior to manure storage, 27.7% changed/improved manure application methods to be neighbor friendly, and 4.6% change method/type of manure storage. Using the attendance figures from the past year, results could be extrapolated to indicate that 17 managers increased frequency of manure testing, 36 now regularly notify neighbors prior to manure storage, and 60 changed/improved manure application methods to be neighbor friendly. Ten (10) changed their method/type of manure storage.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
112	Watershed Protection and Management
401	Structures, Facilities, and General Purpose Farm Supplies
403	Waste Disposal, Recycling, and Reuse

**Outcome #3****1. Outcome Measures**

Number Of Subsurface Bioreactor Acres In Illinois

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	100

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

Subsurface drainage (tile) systems are ubiquitous in Illinois. These drainage systems have a significant effect on production agriculture and water quality of the watersheds in which they occur. Without tile drainage, crops could not be economically grown on much of what is now the most productive land in the state.

**What has been done**

The installation of subsurface bio-reactors is an attempt to provide a subsurface solution to a subsurface problem. In flat, tile-drained watersheds such as are common in central Illinois, vegetative filter strips are not very effective, since much of the water that enters streams and rivers flows through subsurface tile drains, never coming into contact with the filters on the soil surface. Tiles are normally placed 4 to 5 feet below the soil surface. Because of the flatness of the land, there are few areas where wetlands can intersect these tiles. Subsurface bio-reactors do not suffer from these limitations, and unlike other edge-of-field treatment methods, they do not require that land be taken out of production.

**Results**

This project has led to a significant increase in the implementation of conservation drainage systems on farms in Illinois, culminating with the Natural Resources Conservation Service initiating a cost share program for developing Drainage Water Management plans.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities

**Outcome #4**

**1. Outcome Measures**

Improved Utilization Of Mechanized Precision Farming

**2. Associated Institution Types**

•1862 Research

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	0

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

The goal of this research program is to create a capable system for crop growers to safely and efficiently practice effective and profitable mechanized precision farming operations.

**What has been done**

Efforts have been focused on creating an innovative concept of visual situation awareness technology for mobile agricultural machinery. A stereovision surrounding observation technology can provide a reliable and accurate means to gain situational awareness surrounding the operating machinery for enhancing safe operations.

**Results**

The impact of such technology is very significant: It is very easy to achieve a crop production goal of increase yield by a few percent without consuming any more resources through more efficient production management. If the research outcome could assist crop growers to realize a 2% yield increase in their production through more efficient management, it would increase the farm income by at least \$5,500 per year for a grower planting 500 acres of corn based on the average yield of corn and the average corn price in 2007. For the total acreage of over 81 million acres of corn planted in the United State in 2005, the 2% higher yield of corn alone would mean a \$45 billion dollars more income to the agriculture industry. In addition, an automated visual situation awareness device could provide farmers a reliable safety function on their machinery, and lead to a more efficient operation by creating a safer operating environment.

**4. Associated Knowledge Areas**

KA Code	Knowledge Area
402	Engineering Systems and Equipment
404	Instrumentation and Control Systems

**Outcome #5****1. Outcome Measures**

Installation Of Home Radon Mitigation Systems Or Removal Of Mold In Homes

**2. Associated Institution Types**

•1862 Extension

**3a. Outcome Type:**

Change in Action Outcome Measure

**3b. Quantitative Outcome**

Year	Quantitative Target	Actual
2007	{No Data Entered}	5170

**3c. Qualitative Outcome or Impact Statement**

**Issue (Who cares and Why)**

In recent years, indoor air quality has become a national health concern. Indoor air quality is a rising concern particularly among builders and homeowners. A growing body of research indicates that the air people breathe inside their home can be more polluted than the air outside. U.S. Environmental Protection Agency (EPA) studies have shown that the levels of many airborne pollutants may be 25 to 100 times higher indoors than outdoors. Since most people spend about 90% of their time indoors, the quality of indoor air is important.

Among the pollutants is radon. Radon is the second leading cause of lung cancer in the United States, and the leading cause of lung cancer among non-smokers. Radon exposure costs over \$2 billion dollars per year in both direct and indirect health care costs.

**What has been done**

Train the trainer workshops were conducted for 22 Extension staff and volunteers, 5 Health Department staff, and 13 childcare providers on healthy indoor air topics. Extension staff distributed 135 Healthy Homes books and promoted the Extension website [www.takeactiononradon.uiuc.edu](http://www.takeactiononradon.uiuc.edu). The Illinois Emergency Management Association (IEMA) gave out 31,963 free radon test kits, many to people who were directed to them through the Extension website.

**Results**

According to IEMA, approximately 5,000 new and existing homes in Illinois had radon mitigation systems installed. Homes where mold was detected and removed numbered 170, directly influenced by information and advice from Extension staff.

**4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
401	Structures, Facilities, and General Purpose Farm Supplies
404	Instrumentation and Control Systems

**V(H). Planned Program (External Factors)****External factors which affected outcomes**

- Competing Programatic Challenges

**Brief Explanation****V(I). Planned Program (Evaluation Studies and Data Collection)****1. Evaluation Studies Planned**

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

**Evaluation Results****Key Items of Evaluation**