2008 University of Illinois Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

The College of Agricultural, Consumer and Environmental Sciences

At this writing, the University and its units, including the College of Agricultural, Consumer and Environmental Sciences, face very significant economic and budgetary uncertainty. External factors have shifted radically in the past year, so we must be ready to embrace unprecedented changes. At issue are the central principles of the land-grant university and whether this mission is consistent with the direction of a research intensive university. The College is fundamentally guided by the principles of the land-grant philosophy, which for ACES means actively discovering, advancing, and integrating new knowledge to ensure nutritious and safe food, sustainable and innovative agriculture, strong families and communities, and environmentally sound natural resource management to benefit the people of Illinois and the world. Our multidimensional mission requires capacity and functional programs in areas of fundamental and applied research, education, and public engagement that are highly relevant to the needs of students, employers, communities, and families, and support robust food, agricultural, and more recently, energy systems. To fulfill the University's land-grant mission, ACES is responsible for the Illinois Agricultural Experiment Station and University of Illinois Extension, subsidiary units authorized by federal and state statutes that complement the academic departments.

UniversityofIllinoisExtension

The statewide Extension program has shown strong growth in the last three years, driven by local support, state investments in specific program areas, and increasing grant and contract activity. Despite the aggregate growth, Extension funding is constrained in specific ways, with increasing pressure on federal formula funding from USDA, state base funding for campus and center based activities, and specific state appropriations that are at risk. In FY 2008, Extension accounted for $92,238,302 [51.7%] of the total expenditures in ACES, a 4.9% increase over the previous year. Extension reaches more than three million people face-to-face in Illinois with educational outreach programs in agriculture and natural resources; nutrition, family, and consumer sciences; 4-H youth development; and community and economic development. The statewide Extension system employs approximately 363 professional field staff, a decrease of more than 30 FTE in FY 2009 from the previous year, in anticipation of reduced county-based and university-based funds. University of Illinois Extension is assisted by over 50,000 volunteers in all 102 counties in the state.

The Illinois Agricultural Experiment Station [Office of Research]

The research mission of ACES is closely aligned with the Illinois Agricultural Experiment Station [IAES], which operates as a statutory state-federal partnership. The IAES is directed by the Associate Dean for Research. The IAES/ACES research activities accounted for [35.6%] of the expenditures in the College last year. The research portfolio of the Illinois Agricultural Experiment Station includes mandated and mission-oriented research to support stakeholders in Illinois, in partnership with USDA and entities in the state.

The Twelve Planned Programs

4-H Youth Development – Activities in 2008 focused on volunteer training, social emotional learning teacher training, character education curriculum development, and the three national areas of focus—science, engineering, and technology [SET]; healthy lifestyles; and youth leadership. SET activities included community mapping with GIS/GPS, robotics team competitions, national release of Illinois' Power of Wind curriculum, a Youth Informatics Forum, and overnight experiences such as Science Siesta and Illinois Summer Academies to create awareness and interest in science careers. Healthy lifestyles and health careers were the focus of Health Jam, a collaborative program successfully conducted for the third year.

Agricultural and Biological Engineering – Activities in 2008 included development of a new agent-based model for testing the resiliency of new agro-ecosystems, developing and testing a new image-based, portable droplet size measurement tool to improve current application system efficiency, creating an automated path planning tool implementable on mobile agricultural

machinery and designing a crop health detection system for mechanized precision crop production, certified livestock manager training workshops and online training series, and crop guidance systems presentations at regional state crop management conferences. [See Plant Health, Systems, and Production planned program report.]

Agricultural and Consumer Economics – Activities in 2008 included research in the areas of intellectual property rights, organic agriculture, voluntary pollution reduction, land conservation strategies, household rain-barrel adoption, the ongoing development of the Varietal Information Program for Soybeans [VIPS] database and Farmdoc, extensive efforts to create and publicize the new Getting Through Tough Times website of resources to help consumers deal with the current economic challenges and environment, a statewide series of teacher/finanacial educator training on using various personal finance resources, and expansion to other states of Annie's project, a curriculum designed to enhance the farm management leadership skills of women involved in agricultural operations.

Animal Genomics – Activities in 2008 included creation of a high-density porcine SNP chip that will be used to create a HapMap of the pig genome, support for the effective application of genomics and proteomics information to the advancement and sustainability of the U.S. cattle industry, and research designed to determine if gene expression profiles of peripheral blood leukocytes can be used as a method to predict genetic merit for milk production traits in dairy cattle.

Animal Health and Production – Activities in 2008 included several research projects conducted to evaluate the interactions of genetics and environment/nutrition on muscle development and adiposity, a study of the use of corn fibers to provide an economical and abundant source of dietary fiber which may also serve as a replacement for beet pulp in pet food diets, work that has established for the first time in the U.S. a detailed description of the conditions on a typical swine trailer during journeys from the farm to the packing plant, the development of analytical procedures that can be offered as standard diagnostic tests for fumonisin toxicity, continuing expansion to other states of MarketMaker—an interactive web-based market system connecting producers and markets for agricultural products, and a wide variety of programs that address animal production and health. This year's report highlights Extension programming and impact related to pork production and horse ownership.

Biofuels – Activities in 2008 included a study to investigate the viability of using butanol as a diesel fuel, an analysis of how to increase acres for ethanol production without displacing food crops, and research designed to benefit the biotechnology industry and soybean producers by providing basic information on gene regulation in soybean, specifically of the flavonoid pathway and potentially in several important developmental pathways including the formation of cell walls, leaves, and trichomes.

Community Resource Planning and Development – Activities in 2008 included continued involvement in river restoration and in community economic development efforts along the Mississippi and Illinois Great Rivers, work on the role of water operators in implementing Source Water Protection, county official certification programs, expanding data gathering assistance to communities for decision-making and planning, enhancing non-profit and local government success in securing federal funding through grants, and hosting a multi-state earthquake preparedness conference.

Food Product Development, Processing and Safety – Activities in 2008 included continued development of ultrasound technology as a new food processing modality, experiments on the use of membranes in combination with sub-critical fluids to refine crude vegetable oils, research that has focused on the chemistry of lipids in chocolate as affected by storage conditions, food safety and sanitation training for youth through presentation in pre-schools, schools, and 4-H workshops, and food safety training through programs such as the Food Safety Refresher Course for volunteers and employees of establishments that prepare or serve food to the public.

Human Development and Family Well-Being – Activities in 2008 included continued development of the More Fun with Sisters and Brothers Program curriculum, a project examining variations in co-parenting relationships for divorced mothers who experienced violence during their marriages, the ongoing implementation of the Child Development Laboratory [CDL] Research Database, continual updates to Parenting 24/7 web-based resources, collaborative community educational outreach to parents of "at risk" newborns to provide resources and programs, continued delivery of the Intentional Harmony work-life management curriculum, and workshops for childcare providers and caregivers of elderly.

Human Nutrition, Diet Adequacy, Health and Well-Being – Activities in 2008 included cell culture and piglet studies to determine whether soy isoflavone could reduce the ability of rotavirus to infect cells, development of an improved lycopene extraction method from tomato cell culture, expansion of Dining with Diabetes and other programs and websites focusing on managing diabetes, piloting a new holistic self-management program for adults who have any type of ongoing health condition[s], and youth cooking schools, camps, and classroom and group activity guides to promote healthy food choices and physical activity.

Natural Resources and the Environment – Activities in 2008 included developing a base-flow model calibrated with data collected from two tile-drained watersheds in east central Illinois, development of new analytical methods for simultaneous

detection of multiple target pharmaceuticals and pesticides, identification of new impatiens lines with improved levels of resistance to western flower thrips, the creation of nutrient criteria for all rivers and streams in Illinois, a statewide series of tillage workshops, soil and water workshops, an audio conference series addressing current environmental concerns, development and piloting of a curriculum and training for the new Illinois Master Naturalist program, and support for hazardous medicine, electronic waste, and plastic garden plant trays and pots community collection events.

Plant Health, Systems and Production – Activities in 2008 included transformation investigations that produced a 2,4-D tolerant wine grape called "Improved Chancellor", insecticide evaluations that provided Midwest growers with specific information on the effectiveness of newly labeled insecticides against key pests of apples and peaches, continued research into the management of Phytophthora Blight in support of the pumpkin industry [currently the most valuable vegetable industry in Illinois], and trained Master Gardener involvement in providing information on environmentally friendly plant production, digital diagnosis and recommendations for plant-related problems, pesticide safety education, and conferences, clinics, websites, and field days addressing crop management and local food system issues.

Total Actual Amount of professional FTEs/SYs for this State

Year:2008	Extension		Research	
	1862	1890	1862	1890
Plan	361.0	0.0	155.0	0.0
Actual	216.2	0.0	150.0	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

Hatch projects are reviewed at the Department level before being submitted to CSREES, where they are again formally reviewed before being eligible for funding.Criteria for review of individual projects is established by the Department submitting the proposal for consideration.For example, in the Department of Agricultural and Biological Engineering reviewers are selected for each project by the Head and given general guidelines [that the proposal must "address a timely topic and contain approaches that are technically sound", for example]. Guidelines given to reviewers are more specific in the Department of Agricultural and Consumer Economics, as proposals are evaluated based on [1] Scientific merit - An important question that will provide new theoretical and/or methodological information; [2] Technical merit - Quality of the methods and procedures outlined by the Investigator; and [3] Capacity and Resources - The extent to which the scientist has the expertise, staff support, and laboratory equipment to effectively complete the project. Review panels in the Department of Natural Resources and Environmental Sciences range from two to four [with input on selection from the PI considered], and criteria for evaluation include: [1] Is the research adequately justified?; [2] Are objectives well-focused and can progress be measured?; [3] Are potential sources of collaboration identified?; [4] Does the proposal potentially duplicate existing efforts?; and [5] Are the key clientele who would be served by the research clearly identified?

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. During the visit 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.

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
- Survey of traditional stakeholder groups
- Survey of traditional stakeholder individuals
- Survey of the general public
- Survey specifically with non-traditional groups
- Survey specifically with non-traditional individuals

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.Stakeholder input on research-related issues is also encouraged through the College Research Advisory Committee.

A formal statewide stakeholder Extension input process is currently in progress. This past year 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
- Use Internal Focus Groups
- Use External Focus Groups
- Open Listening Sessions
- Needs Assessments
- Use Surveys

Brief Explanation

One important source for stakeholder input from the research community is the College Research Advisory Committee.The group's most recent meeting took place on September 9th, 2008.Members in attendance included Ken Dalenberg [District Director for the Illinois Soybean Association], Ramlakhan Boodram [CEO of Proviant Technologies], John Reifsteck [John Reifsteck Farms], and Tamara White [Senior Director of Commodities for the Illinois Farm Bureau]. The goal of the ABG Vision for Illinois Agriculture project is to identify and develop strategies that will enhance and grow the competitiveness of the Illinois food and fiber industry.The initiative was led by a steering committee that included Phillip Nelson [President of the Illinois Farm Bureau], Robert Easter [Dean of the College of ACES], Greg Webb [Vice President for Public Affairs for Archer Daniels Midland], Don Borgman [Director of Planning for Deere and Company], Tom Jennings [Director of the Illinois Department of Agriculture], David Miller [President of iBIO Institute], Gary Ash [President of First Farm Credit Services], Lyle Roberts [Chief Executive Officer of the Illinois Soybean Association], and Rodney Weinzierl [Executive Director of the Illinois Corn Growers Association]. The group released their final report in April of 2008.

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

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.Other methods discussed in this report include the College Research Advisory Committee and the ABG "Vision for Illinois Agriculture".

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 Council is to discuss internal and external issues that Extension can or should address. In addition, staff use meetings with collaborators, attendance at stakeholder groups, or appointments with individuals to collect input to guide programming decisions. In limited cases this year, formal surveys have been used to gather input from non-traditional groups. Another key input method is the use of evaluation instruments to evaluate a given program that includes 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

External stakeholder input has been involved directly in strategic planning processes for the College of ACES and several of its subunits, including University of Illinois Extension and the Illinois Agricultural Experiment Station. These strategic processes range from input on the College's 5-year strategic plan to Extension's strategic agenda to regular consultations on emerging research issues.

In limited cases, stakeholder input is involved directly in decision making for allocation of resources, for example the C-FAR directors collaborate with the universities to establish research themes and projects are selected for funding by members and directors of C-FAR through competitive and collaborative processes.In the case of the NSRL, the soybean stakeholders provide direct allocation oversight to funds that originate from soybean check-off sources and collaborative advice on some research funded from other sources, such as special USDA appropriations, for which they play an advocacy role.

Most external stakeholder input has an indirect influence on budgeting decisions and setting priorities, by informing the institutional management of various needs, issues, constraints, and opportunities, which are in turn factored into management decision making. Moreover, organized stakeholders, such as Extension Partners, commodity organizations, and general farm organizations, serve as advocates of university research, outreach, and teaching with third party resource providers, such as local, state, and federal government and private foundations.External stakeholders have an advisory role for particular hires of relevance to certain specific research or extension functions.For example, the university seeks input on externally funded chairs or professorships, such as agricultural policy, soybean strategy, and crop breeding, and positions that serve campus specialist or local educator needs for Extension. Final decisions are reserved for the institution.

Brief Explanation of what you learned from your Stakeholders

Topics discussed at the 2008 meeting of the College Research Advisory Committee included a report by the Director of the Illinois Station [including the development of the "Community of Scholars" program to link groups of faculty members across several departments under common themes] as well as updates on C-FAR [the Illinois Council on Food and Agriculture Research], CABER [the Center for Advanced Bioenergy Research], ECI [the Environmental Change Institute], FRC [the Family Resiliency Center], and NSRL [the National Soybean Research Laboratory] provided by unit Directors.Specific issues addressed by the Committee included their continuing support of C-FAR despite significant state funding cuts over the last several years, a need to provide additional support to research and instruction [especially in the Department of Crop Sciences], and strong support for International programs [particularly with regard to soybean research].

The planning committee for the ABG initiative first identified a vision statement: *To be the global leader of profitable food and agricultural production*.Three goals were then identified for the food and agriculture industry: [1] Grow agricultural production and exports to a top three ranking in the United States through the growth of both commodity and value added production; [2] Enable food manufacturing growth to a top three ranking in the United States; and [3] Lead the United States as the alternative bio-based outcomes leader through the adoption of new technologies. To accomplish the above goals, five strategic themes were identified: [1] Attract and train the necessary human and capital resources to support initiatives aimed at growing the food and agriculture industries; [2] Create a favorable business environment to nurture economic development in the state; [3] Improve community vitality; [4] Advance intellectual and innovation resources; and [5] Act as a catalyst in forming strategic partnerships aimed at growing and sustaining the food and agriculture industries. The complete report can be viewed at:http://www.illinoisagriculturevision.org/files/final4-28-08.pdf.

As mentioned, no systematic input was gathered 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. In addition, the State Extension Advisory Council members have 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 [brief description of 138 programs have been posted on the web for staff referral], 2) find issues and needs that haven't yet been served or are being served inadequately and develop programs for target groups [e.g. elderly and retirees], and 3) pursue opportunities for corporate support for Extension.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
8703634	0	5721715	0

2. Totaled Actual dollars from Planned Programs Inputs

	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	10544474	0	7499669	0
Actual Matching	8703634	0	7499669	0
Actual All Other	72990194	0	38889298	0
Total Actual Expended	92238302	0	53888636	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous years

Carryover	1840842	0	5393413	0

V. Planned Program Table of Content

Program #1

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
806	Youth Development	100%		100%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	75.0	0.0	3.0	0.0
Actual	57.5	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
2804830	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2315166	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
19415391	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

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

Science, Engineering, and Technology [SET] A variety of activities occurred this year related to SET including community mapping with GIS/GPS, robotics team competitions, national release of Illinois' Power of Wind curriculum, and club participation in a nationwide science experiment. 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.Curriculum has been developed and is being piloted, and a Youth Community Informatics Forum was held last summer involved 40 youth from a variety of disadvantaged, minority communities through the state.

Science Siesta and Advanced Science Siesta These programs designed for girls in grades 4-6 and 7-8 introduced them to fun hands-on science activities and career opportunities. The program aims to dispel myths that science is too difficult, not fun, and more suited to males. Illinois Summer Academies are three-day conferences on the University of Illinois campus that provide high school teens with opportunities to explore a college campus, hands-on workshops on potential careers in SET, or leadership development training.

Health Jam This program involves 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. During the nine-week program, youth complete the "Walk Across Illinois" to achieve 30 minutes of daily physical activity.

Volunteer Training Volunteers are key in delivering 4-H youth development programs and are instrumental as caring adults who create an environment that is a critical element of positive youth development.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.

2. Brief description of the target audience

Youth, youth leaders [paid and volunteer], teachers, 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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	**Target**	**Target**	**Target**	**Target**
Plan	8900	25000	114000	100000
2008	167557	0	381554	211133

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	2	7	
2008	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of completed research projects.

Not reporting on this Output for this Annual Report

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O No.	OUTCOME NAME
1	Number demonstrating or reporting KASA changes.
2	Number demonstrating or reporting behavior changes.
3	Knowledge To Recognize Child Abuse
4	Increased Knowledge Of Science And Science-Related Careers
5	Increased Knowledge Of Health Factors And Health Careers

Outcome #1

1. **Outcome Measures**

Number demonstrating or reporting KASA changes.

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

Number demonstrating or reporting behavior changes.

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

Knowledge To Recognize Child Abuse

2. **Associated Institution Types**

•1862 Extension

3a. **Outcome Type:**

Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	{No Data Entered}	85

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 caring relationship with youth in order to effect their development in a positive manner.

What has been done

A variety of volunteer training was conducted for 4-H volunteers. Keeping Youth Safe was delivered by Extension staff to 87 volunteers this year and more than 150 volunteers were enrolled 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 with a 4-H club, and experiential learning.

Results

Post training evaluations were developed and distributed to participants for all training modules and follow-up evaluation instruments to identify practice changes were available for some of the training modules. Evaluations collected from participants in Keeping Youth Safe indicated that 85 [98%] of the participants increased their knowledge of how to recognize child abuse. Due to variations in participation and evaluation response rates, quantitative measures of knowledge or practice changes varied greatly with respect to the six modules in the Valued Volunteer Orientation Series. Space limits of this reporting format do not allow for comprehensive qualitative description of participant feedback; however, in general, the majority of volunteer participants became more knowledgeable about resources available, planning effective club meetings, ways to incorporate critical elements of positive youth development, using text messaging to communicate with youth, and the experiential learning process.

4. **Associated Knowledge Areas**

KA Code	Knowledge Area
806	Youth Development

Outcome #4

1. Outcome Measures

Increased Knowledge Of Science And Science-Related Careers

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	160

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Even though jobs requiring advanced degrees in science and math continue to flourish, women remain underrepresented in these careers. While women make up 46.3% of the workforce in the United States they account for only about 28% of those employed in computer and mathematical occupations, engineering occupations, and life, physical, and social science occupations.

What has been done

New curriculum have been or are being developed including Power of Wind [completed] and GIS/GPS curriculum outline. Five counties have formed tech teams, received free robotics and GIS/GPS equipment, and are currently piloting materials developed by Nebraska 4-H. Five counties have received ESRI 4-H Community Mapping Grants and four counties will be piloting Youth Works community mapping activities. Several multi-day conferences that focus on SET or SET careers are held at the state or multi-state level including Science Siesta and Advanced Science Siesta that introduce girls to careers available to them related to SET through interaction with female scientists, videos, and hands-on field and lab science activities. Science Siesta is held at museums and the advance session was held on the campus of the University of Illinois. Pre-tests and post-tests were distributed to the 151 Science Siesta participants and 27 advanced participants.

Results

Of the 160 girls who participated in Science Siesta, 113 [70%] improved their post-test scores indicating that their knowledge of veterinarian science and urban ecology improved. When asked if they were more aware of science-related careers, 94% agreed or strongly agreed and 88% indicated that the event increased their interest in science-related careers. In addition, 96% learned science techniques they didn't know before and 87% felt more confident in their ability to study science. Of the 27 girls who completed pre and post tests in the Advance Science Siesta held on campus 5 of 27 [18%] improved pre to post scores related to the Miscanthus field visit, 15 of 27 [55%] improved scores related to Wind Farms, and 11 of 27 [41%] improved scores related to the solar energy workshop. Application of a paired t-test to collected data indicated that the group knowledge increased related to wind energy generation [mean test score significant at p=.02] and solar energy [mean test score significant at p=01].

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Increased Knowledge Of Health Factors And Health Careers

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	92

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Unhealthy lifestyles are a serious health concern for Illinois and many other states that have rising levels of childhood obesity, diabetes, and lack of physical exercise, all of which contribute to chronic health problems.

What has been done

University of Illinois Extension formed a collaborative partnership with the following groups: National Center for Rural Health Professions, KSB Hospital, University of Illinois College of Medicine at Rockford, and Archer, Daniels, Midland Company to deliver Health Jam. Ninety-two [92] elementary students 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', which involved 30 minutes or more of daily physical activity to complete the Walk Across Illinois.

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 also completed a pre/post test to evaluate gains in content knowledge. The statistical analysis showed that Health Jam made a significant difference [p<.01] regarding the student's knowledge about health careers and a significant difference [p<.05] regarding 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.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes
- Public Policy changes
- Competing Public priorities
- Competing Programmatic 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 #2

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	5%		10%	
401	Structures, Facilities, and General Purpose Farm Supplies	10%		15%	
402	Engineering Systems and Equipment	10%		10%	
403	Waste Disposal, Recycling, and Reuse	47%		20%	
404	Instrumentation and Control Systems	20%		20%	
405	Drainage and Irrigation Systems and Facilities	8%		10%	
511	New and Improved Non-Food Products and Processes	0%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.4	0.0	6.0	0.0
Actual	3.7	0.0	5.8	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
179256	0	318780	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
147962	0	318780	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
1240833	0	1741076	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub goal "To improve agricultural productivity through the use of intelligent machines" include the continued development of a mass flow measurement device for granular materials [the power of the method developed is that it is based on a solid mathematical model, is valid for any particle irrespective of its diameter distribution, and most importantly does not require calibration]; developing and testing a new image-based, portable droplet size measurement tool to improve the current application system efficiency, as well as carrying out experiments to test the precision map and sensor based variable-rate technologies for reduced usage of herbicides in crop fields [these tools will help to reduce the overall chemical input cost of crop production and reduce the negative environmental impact of agriculture production practices]; creating an automated path planning tool implementable on mobile agricultural machinery and designing a crop health detection system for mechanized precision crop production; research examining the effect of automatic spray rate controllers on spray droplet size and pattern uniformity in an effort to reduce spray drift; and the development of two types of biosensors, one developed with a simple thin layer chromatography-based sensor to detect glycerol in biodiesel and a second being a "whole cell biosensor", a bacterial cell engineered to detect specific substances in its surroundings.

Activities under the sub goal "To utilize holistic approaches to provide engineering solutions" include the development of web-based instructional activities to prepare students entering technical systems management classes [discussed in detail in the Community Resource Planning planned program], including topics such as tool and component identification, safety practices, fundamental scientific principles, and application of instructional practices. Also under development is a new agent-based model for testing the resiliency of new agro-ecosystems; techniques are also under development allowing assembly of this information in a database that will allow users to configure new scenarios based on current research data.

Conferences and presentations made by Investigators under this Planned Program in 2008 included The American Society of Agricultural and Biological Engineering Annual Meeting and The International Livestock Environment Symposium.

Extension activities have a heavy focus on livestock manure management. These activities include for the livestock sector, 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, 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 Certified Livestock Manger Training workshops, and The Illinois Manure Management Program website [www.immp.uiuc.edu] help livestock producers to develop manure management plans to more efficiently and safely use manure as a fertilizer. Some producers are required to have plans by state or federal regulations and some have plans to better use their farm’s nutrients in growing crops. The Voluntary Commercial Manure Applicators Training Program is provided for companies that commercially apply manure for livestock producers, includes topics related to safety, rules and regulations, calibrating equipment, being a good neighbor, odor, proper application rates, best management practices, andenvironmental awareness.

In addition, presentations related to crop production guidance systems were included in the Regional Crop Management Conference series and in county programs as requested.

2. Brief description of the target audience

Includes academics in the areas of sensor development and variable rate application, farmers, and the equipment industry. Extension target audiences include livestock producers with 300-999 animal units, livestock producers with over 1,000 animal units, crop producers, and landowners.

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	2500	400	200
2008	6403	1897	1394	0

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	1	60	
2008	0	16	16

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research projects.

Year	Target	Actual
2008	9	1

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	To Utilize Nanotechnology To Develop High-Value Uses For Agricultural Products
4	Number Of Subsurface Bioreactor Acres In Illinois
5	Development And Use Of A Manure Management Plan

Outcome #1

1. **Outcome Measures**

Number reporting or demonstrating KASA changes.

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

Number demonstrating or reporting practice changes.

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

To Utilize Nanotechnology To Develop High-Value Uses For Agricultural Products

2. **Associated Institution Types**

•1862 Extension
•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Illinois will participate in a multistate project using nanotechnology to develop high value uses for agricultural products, with an effort to increase their economic value. Illinois will also develop nanoscale devices and systems, as well as educational and outreach materials, in collaboration with other participating institutions in this multistate project.

What has been done

Work was done on two different goals outlined in the Hatch proposal. Under nanotechnology applications, we have discovered some important phenomena pertaining to the aggregation of a corn protein, zein. We have determined, e.g. that the aggregation process follows an Arhennius-type relationship with respect to temperature. Under bioinformatics applications, we are engineering a strain of cyanobacteria capable of producing ethanol directly from sunlight. We have determined the specific genes in the pathway that need to be introduced in the cyanobacteria. Currently, we are trying to insert the pathway in cyanobacteria to test the pathway. Also under this goal, we have demonstrated a novel genetic circuit that can be used to amplify the production of a membrane protein. Membrane proteins are an object of intense scientific and pharmaceutical investigation, and sufficient quantities of protein need to be produced for crystallization and analysis. Our technology can cut down the time to produce membrane proteins to a third. We have tested this system for a well-characterized protein called bd oxidase.

Results

We have developed a rational methodology to characterize the aggregation, temperature dependance, and microrheological characteristics of highly polydisperse protein solutions. Such techniques may have wider application, e.g. in the understanding of pathogenic proteins such as amyloid proteins that are suspected to cause Alzheimer's disease. The application of bioinformatics and molecular biology techniques to develop novel genetic circuits is quickly becoming an important engineering discipline called synthetic biology. It is expected that synthetic biology is the intellectual framework which will lead to the biotechnology of tomorrow. Our contribution to developing novel genetic constructs based on the principles of synthetic biology could become a part of the 'molecular toolbox' for biotechnologists of the future.

4. Associated Knowledge Areas

KA Code	Knowledge Area
404	Instrumentation and Control Systems
511	New and Improved Non-Food Products and Processes

Outcome #4

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
2008	{No Data Entered}	340

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

There is currently approximately 340 acres served by bioreactors. We do not foresee any increase in this number for the next two or three years until we have addressed the problem of mercury methylation that we are observing with the systems.

4. Associated Knowledge Areas

KA Code	Knowledge Area
405	Drainage and Irrigation Systems and Facilities
401	Structures, Facilities, and General Purpose Farm Supplies
403	Waste Disposal, Recycling, and Reuse
404	Instrumentation and Control Systems

Outcome #5

1. Outcome Measures

Development And Use Of A Manure Management Plan

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	278

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 the implementation 13 years ago of livestock manure management regulations that include required training and certification testing, Extension has been designated the responsibility and has been conducting workshops and an online quiz series to address the regulations administered by the Illinois Department of Agriculture. This past year 12 workshops attended by 584 participants were conducted across Illinois with a certification exam administered following the workshop.

Results

Using technology to administer a one question evaluation regarding the development and use of a livestock manure management plan at 11 program locations yielded the following impact results: 113 [27%] of 426 respondents to the question indicated that their plan was 'written, but not updated regularly' and 165 [39%] of 426 respondents indicated that their plan was 'written, updated annually, and constantly used.' A follow up of certified livestock manager workshop attendees in 2003 assessed specific practice changes changed as a result of the training. Based on this year's attendance [584] and using percentages from the 2003 assessment, results could be extrapolated to indicate that 46 [8%] increased frequency of manure testing, 161 [27.7%] changed/improved manure application method to be neighbor friendly, 97 [16.7%] now regularly notify neighbors prior to manure storage, and 26 [4.6%] changed their method/type of storage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
402	Engineering Systems and Equipment
401	Structures, Facilities, and General Purpose Farm Supplies

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

Program #3

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	50%		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	50%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	13.0	0.0	12.0	0.0
Actual	21.4	0.0	18.5	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
1043903	0	800809	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
861660	0	800809	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
7226029	0	3769743	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub-goal "To inform and improve decisions related to Midwest commercial food and agriculture sectors involving production, financing, marketing, and risk management" included research on intellectual property rights [resulting in a series of strategy recommendations for agro-biotechnology research entities]; research on organic agriculture which assisted farmers, processors, and retail distributors of natural organic products to navigate pending legal issues; research on agricultural biotechnology issues which resulted in recommendations to agricultural firms on avoiding liability exposure due to coexistence failures; consulting with the soybean industry in Brazil on issues regarding management and protection of intellectual property; and continuing evolution of both the Varietal Information Program for Soybeans [VIPS] database [which provides Illinois producers and industry groups with an unbiased source of soybean production information] and Farmdoc [a website containing online crop insurance tools including premium calculators for crop insurance products and decision tools that compute payoffs and risk statistics for representative farms in each of the counties in Illinois, Indiana, and Iowa, as well as selected counties in Minnesota and Maryland].

Activities under the sub-goal "To identify and estimate the impact of federal and state policies on rural communities, agricultural producers, and society, and to help inform the policy making process" included research which made clear that distortionary agricultural subsides impose welfare costs and contribute to higher nitrogen pollution, creating an opportunity for double dividends through environmental policies; research on cellulosic biofuels which showed that rewarding biofuels based on their environmental attributes would help promote a sustainable mix of feedstocks; research on voluntary pollution reduction which found that the impact of such initiatives is weak, transitory, and short-lived; studies of land conservation strategies which show that government conservation agencies can either displace [as in Massachusetts or Illinois] or stimulate [as in California] private conservation activity; an analysis of household rain-barrel adoption which illustrates that rain-barrel programs [as in the City of Chicago] can be more effective if distribution points are located to reduce the distance people must travel to buy a rain barrel, and if education programs are used to help households understand the benefits of such decentralized stormwater management devices; and a study of enhanced stormwater-control regulations that indicates that such standards could yield large social benefits for little or no cost.

Activities under the sub-goal "To describe and measure the well being of individual consumers, families, and communities resulting from changes in economic and regulatory conditions" included work on a series of projects related to household bargaining, risk aversion, and portfolio choice.

Conferences and presentations made by Investigators under this planned program in 2008 included the American Agricultural Law Association, American Bar Association, Midwest Organic Production and Marketing Conference, Argentinean-American Chamber of Commerce, Illinois Soybean Research Forum, Iowa Soybean Association, Mato Grasso Foundation, Taiwan Preferred Team, Illinois Commodity Conference, American Council on Consumer Relations, Federal Reserve Bank of Chicago, Credit Union National Association, Money Management International, Midwest Economic Association, and the National Symposium on Financial Literacy and Education.

The Getting Through Tough Financial Times program was initiated in response to the current economic times that consumers are currently facing and includes a website [http://www.ToughTimes.illinois.edu] that provides timely resources, links to related money management resources, and a listing of events being held throughout Illinois. This is a "one-stop" shop for all University of Illinois Extension resources to help people whose financial security is threatened. Other products related to this initiative include: *Spend Smart, Save Smart* tip sheets – each of the twelve sheets offers 10 practical tips to help consumers spend wisely or save money, and a audio-conference entitled"Saving and Investing in Turbulent Times" featuring a panel discussion byExtension educators and professors.

The University of Illinois Center for Economic and Financial Education offered a series of six personal finance training conferences for teachers and other educators during 2008.Participants were introduced to standards-based curricula in economics, personal finance, and entrepreneurship and received numerous activities they could take back to the classroom or their organizations. They were also introduced to guest speakers from the financial industry who discussed the recent financial crisis and key economic issues facing consumers in the U.S. and around the globe.

Annie’s Project—Education for Farm Women is a curriculum designed in Illinois to enhance the farm management and leadership skills of women involved in agricultural operations.The curriculum is delivered in multiple locations across the state using local agricultural resource persons as guest instructors along with Extension personnel.The curriculum has been adopted by other states.

Other consumer-focused Extension programs include Credit Card Smarts and Plan Well Retire Well websites[Spanish and English] and presentations; Consumer Fraud and Identity Theft presentations;and Welcome to the Real World, a simulation that gives students [age 12 through young adults] a taste of future income and expenses.

Extension activities related to agricultural economics included 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.

2. Brief description of the target audience

Practicing lawyers, academic lawyers, farmers, processors, retail distributors of natural and organic products, agricultural biotechnology firms, soybean producers, farm managers, seed companies, university research faculty, university Extension educators, farm bureaus, state and local governments, NGOs, federal agencies, and researchers in family and consumer economics along with others who have an interest in enhancing human security for individuals and families within the U.S. and around the world.Extension audiences also include families facing financial challenges in today's economy and teachers and financial education providers working with youth through non-profit organizations, community groups, and government agencies.

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	4210	2000000	1250	750
2008	31858	10057	3800	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	1	45	
2008	3	54	54

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of completed research projects.

Year	Target	Actual
2008	5	3

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	Number Of Web Hits On The Varietal Information Program For Soybeans [VIPS] Website
4	Utilization Of The Farmdoc Online Crop Insurance Tool
5	Increased Knowledge And Confidence In Teaching Youth About Issues Related To Savings, Investing, And Credit
6	Increased Knowledge Of Asset Allocation And Investment Management
7	Increase Skills In Agriculture Risk Management

Outcome #1

1. **Outcome Measures**

Participants will report/demonstrate KASA changes.

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

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

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

Number Of Web Hits On The Varietal Information Program For Soybeans [VIPS] Website

2. **Associated Institution Types**

•1862 Research

3a. **Outcome Type:**

Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	{No Data Entered}	123000

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

Issue (Who cares and Why)

Illinois soybean producers have the opportunity to access a unique web-based soybean variety information database called the Varietal Information Program for Soybeans [VIPS] viewed at www.vipsoybean.org. The website facilitates variety selection by offering comprehensive and unbiased information about yield, protein, and oil composition, and disease resistance for over 600 soybean varieties.

What has been done

To ensure that varieties preferred by Illinois producers are included in the VIPS database, nearly 15,000 Illinois producers were surveyed for their suggestions of varieties to be evaluated for 2008. Of the 600 varieties tested, over 250 varieties were identified by soybean producers. This information is updated annually in November when Illinois soybean producers need the variety performance information to make variety selection decisions for the next growing season. The VIPS website was assessed and redesigned to incorporate soybean producers' variety selection strategies and influence selection of varieties with higher yield potential. Three agricultural education and outreach cooperators assisted with enhancing the website query structure, navigation, and data presentation. VIPS booklets were distributed at professional meetings and winter extension functions including the 2008 Corn and Soybean Classics. The VIPS was highlighted and over 2,500 copies of the VIPS booklet [printed version of the database] were distributed at the Crop Protection Technology Conference in January 2008 and at the 2008 Corn and Soybean Classics.

Results

The VIPS database provides Illinois producers and industry groups with an unbiased source of soybean production information. Seed companies compare their field evaluation data with the VIPS data and make information updates for their soybean varieties as needed. The VIPS cooperators contact specific seed companies when the company's online data disagrees with the VIPS data, and annually participating companies make corrections about variety traits viewed on seed company websites. A program to enable tracking of website usage by the day, week, and month was updated. This tracking capability allows website administrators to assess the impact that email updates and media releases have on usage of the VIPS website.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation

Outcome #4

1. Outcome Measures

Utilization Of The Farmdoc Online Crop Insurance Tool

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	4255766

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Crop insurance decisions were the major focus of this project. Farmdoc is a website containing online crop insurance tools including premium calculators for crop insurance products and decision tools that compute payoffs and risk statistics for representative farms in each of the counties in Illinois, Indiana, and Iowa, as well as selected counties in Minnesota and Maryland. 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. The site can be found at www.farmdoc.uiuc.edu.

What has been done

The demand for these tools was substantial and met through delivery channels that were well-suited for the research information and tools. Tens of thousands of FAST CDs were also distributed with spreadsheet versions of the tools. In total, this project provided highly valuable information and modeling tools to evaluate available risk management alternatives for crop farmers in an effective, useable, and timely form.

Results

This project substantially improved risk management decisions for crop farms in Illinois, the U.S. cornbelt, and the U.S. great plains. The incorporation of this information into enhanced models provided farmers with important tools to use in evaluating specific farm risk management strategies, particularly as it relates to crop insurance decisions, which have quickly become one of the most important risk management decisions made by farmers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation

Outcome #5

1. Outcome Measures

Increased Knowledge And Confidence In Teaching Youth About Issues Related To Savings, Investing, And Credit

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	215

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Low savings rates, record levels of consumer debt, rising foreclosure rates, and mounting bankruptcies are signs that a large number of U.S. consumers are financially in trouble. Now more than ever it is critical that young adults develop the skills and tools necessary to effectively manage their finances so as to create a secure financial future later on.

What has been done

Between 2007 and 2008, the University of Illinois Center for Economic and Financial Education [CEFE], in direct partnership with Consumer and Family Economics Extension Educators, offered a series of six statewide training conferences for teachers and other educators. The 220 participants were introduced to standards-based curricula including Financial Fitness for Life; Financing Your Future; Making a Job; Mini-Society; and Learning, Earning, and Investing. In addition, participants received numerous activities they could use in classrooms or with their organizations such as online software and calculators, interactive websites, games, etc. [See educational tools at http://financialed.ace.uiuc.edu.] At the end of the trainings, impact data were collected from the conference participants who reach approximately 15,000 youth per year.

Results

Ninety-eight percent [98%] of the conference participants agreed that as a result of participating in the conferences they: 1) were more knowledgeable about issues related to savings, investing, and credit; 2) more confident in talking to students/clients about these issues; and 3) had new information and activities they could take back to the classroom or their organizations. They also indicated that they would share information and materials with students/clients and use the information to better manage their own finances. Qualitative data further revealed the participants were particularly impressed with the quality of the curricula, activities, and supplemental materials and felt the trainings were very effective in teaching personal finance, economics, and entrepreneurship in a unique and engaging way.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #6

1. Outcome Measures
Increased Knowledge Of Asset Allocation And Investment Management

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Low savings rates, record levels of consumer debt, rising foreclosure rates, and mounting bankruptcies are signs that a large number of U.S. consumers are financially in trouble.

What has been done

Extension educators and specialists in Consumer and Family Economics, Family Life, and Nutrition and Wellness developed materials for the newly created Getting Through Tough Financial Times website. In addition, 12 Spend Smart, Save Smart tip sheets offering 10 practical tips to help consumers spend wisely or save money and a statewide teleconference panel discussion entitled 'Saving and Investing in Turbulent Times' were developed. The website went live in the fall of 2008 and was aggressively promoted to the public through printed materials, monthly news releases [350 published with two articles picked up by AP], radio PSA's, and interviews by Extension staff for radio, TV, and newspapers. At least 7 other states have run Illinois news articles. Local business and legislators have assisted in promoting the website and Google lists the site first in a search of 'tough times' out of 51,700,000 sites listed, resulting in a peak of 62,276 monthly hits in January. Thirty-five Extension offices hosted the 116 attendees for the 'Saving and Investing in Turbulent Times' audio-conference.

Results

Fifty participants of the 116 participants in the 'Saving and Investing in Turbulent Times' teleconference completed an evaluation at the end of the program. Of those that didn't reply 'already knew,' the following percent of participants stated they 'agreed' or 'strongly agreed' with these statements: [84%]--I have a better understanding of asset allocation; [76%]--I am better able to avoid investment fraud; [73%]--My knowledge about investment topics has increased; [73%]--I feel more confident about my ability to choose a financial professional; [70%]--I am more aware of how diversification can help me meet my long-term investment goals; and [67%]--I am better able to manage my investments in a turbulent market. More evaluation data will be collected from upcoming conferences

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #7

1. Outcome Measures

Increase Skills In Agriculture Risk Management

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

An increase in women's involvement on the farm began in the 1980's. At this time, farm sales and real estate values plummeted and the 'farm crisis' ensued. With that crisis, more women became active participants on the farm. To be successful these women needed to increase their skills in the areas of production, marketing, financial, legal, and human resources.

What has been done

Annie's Project--Education for Farm Women curriculum was designed and originated in Illinois to enhance the farm management and leadership skills of women involved in agricultural operations. The curriculum was delivered to 72 women this past year in four locations across the state using local agricultural resource persons as guest instructors along with Extension personnel. An evaluation was conducted with 190 Illinois farm women who participated in Annie's Project between 2004 and 2007 using a baseline farm risk management survey of 49 questions that address all five categories of risk as defined by the USDA [production, marketing, financial, legal, and human resources]. The survey was administered during the first session of the training and again via mail six months after the women completed the classes.

Results

Based on a survey response rate of nearly 50%, results indicated that the women believed that they had increased their skills in all five risk categories--a 15.58% change in financial risk management, a 13.7% change in legal risk management, a 10.46% change in human resources risk management, a 8.75 % change in marketing risk management, and a 5.18% change in production risk management. Responses for selected skill questions follow: 1) 25.3% change in preparing an income statement; 2) 21.4% change in preparing a balance sheet; 3) 18.8% change in next generation planning; 4) 18.5% change in comfort with debt level; and 5) 12.8% change in marketing plan preparation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
602	Business Management, Finance, and Taxation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations

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

Key Items of Evaluation

Program #4

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	50%		50%	
304	Animal Genome	50%		50%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	5.0	0.0
Actual	0.0	0.0	3.0	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	764038	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
0	0	764038	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	215733	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub-goal "To develop and utilize tools of genomic biology for the study of influence of management practices on expression of genes important to animal production and health" included creation of a high-density porcine SNP chip that will be used to create a HapMap of the pig genome [discussed on the USDA-CSREES web site at:

http://www.csrees.usda.gov/nea/animals/in_focus/an_breeding_if_pig_snp.html];

upport for the effective application of genomics and proteomics information to the advancement and sustainability of the U.S. cattle industry through [1] survey of proprotein precursor genes that include neuropeptides affecting growth, development, health, and reproduction in cattle, and [2] prediction of neuropeptides from the protein precursor sequence; and research designed to determine if gene expression profiles of peripheral blood leukocytes can be used as a method to predict genetic merit for milk production traits in dairy cattle.

Conferences and presentations by Investigators under this planned program in 2008 included the Joint Statistical Meetings, IEEE International Conference on Bioinformatics and Biomedicine Workshops, Plant and Animal Genomics XVII, Comparative Nutrition Society, Plant and Animal Genome, Cold Spring Harbor Genome Biology Meeting, and the International Society for Animal Genetics.

2. Brief description of the target audience

Dairy, beef, and pig farmers, the cattle and pig feedstock industries, universities, research institutes, governmental agencies, the swine industry worldwide, and the pet food and livestock industries.

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	500	5000	0	0
2008	0	0	0	0

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	49	
2008	0	12	12

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of completed research projects.

Year	Target	Actual
2008	8	2

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

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
2008	50	30

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 clones of the minimal tiling path. 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

This team has remained committed to creating a program that supports the rapid deployment of the information and how to use the generated sequence information. To date a total of 15,266 clones have been selected for sequencing and sent to the pipeline. This covers about 94.1% of the physical map. Sequence from 72% [2,323Mb; 63.6 Mb of this is of finished quality] of the genome is available to the public on the Sanger website [http://www.sanger.ac.uk/Projects/S_scrofa/]. The Sanger Institute organized and hosted an annotation workshop to bring together researchers from the pig community to participate in the manual annotation of the genome sequence. The three-day workshop taught 28 participants how to use the annotation software so they can begin to annotate their regions of interest. Sanger will continue to provide support after the workshop to enable participants to work remotely to finish their annotation.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

Developing A Single Nucleotide Polymorphism Map For Swine

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The pig is the only major agricultural animal that does not have an international SNP Consortium or SNP map. This project unites the many experts together to focus on the identification of SNPs and the production of a publicly available genotyping platform. The development of a SNP chip would permit genome scans for the identification of quantitative trait loci [QTL] and the elucidation of linkage disequilibrium within relevant commercial populations.

What has been done

We have generated 450 million Solexa sequence reads of 36 BPs [raw data]. After data checking, 350 million reads were used for SNP identification in pigs that resulted in the identification of 310,000 SNPs. These SNPs were combined with 200,000 SNPs from other sources to form a combined list of 500,000 SNPs. Of these, 60,212 were selected for inclusion on an Illumina Pig BeadChip array. This array is currently in production and is expected to become publicly available in 2009.

Results

Work focused on the creation of a high-density porcine SNP chip that will be used to create a HapMap of the pig genome. This project was revised to permit utilization of reduced representation libraries [RRL] and second generation sequencing. This revised experimental design expedited and expanded the SNP discovery process. Using this approach, greater than 300K SNPs were discovered with estimated minor allele frequencies within a four-month period. Thus, the development of a commercial product with global utility was realized within the first year of funding. The high density Illumina Infinium SNP chip is currently being manufactured and will be commercially available to the pork industry in early 2009. Over 40,000 assays have been ordered for the chip including orders from universities, research institutes, governmental agencies, and industry worldwide.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures
Improving Selection Procedures To Add Value For Dairy And Beef Producers

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Rapid population growth, urbanization, and growing affluence in the most populous parts of the world are resulting in expanding world markets for livestock products. Enormous future growth is very likely, as developing countries improve both political and economic systems. To compete effectively for those markets, Illinois and the nation must be among the first to implement new livestock technology derived from genomics. The purpose of this project is to identify genes that will contribute to the economical, efficient, and sustainable production of dairy, beef and pork products.

What has been done

For cattle, experiments were conducted to determine the molecular genetic basis of the quantitative trait locus on bovine chromosome 3. Evolutionary analysis of the bovine genome was conducted for the bovine genome sequencing consortium. In addition, the molecular genetic basis of two monogenic diseases in beef cattle, Tibial Hemimelia and Pulmonary Hypoplasia with Anasarca were studied. For swine, experiments were performed to fine map genes responsible for growth rate and meat quality. Services and Products: New DNA-based diagnostic tests for Tibial Hemimelia and Pulmonary Hypoplasia with Anasarca in cattle were developed. A high resolution map of a 3 Mbp region of cattle chromosome 3 containing genes controlling milk production traits was completed and a genetic screening test implemented.

Results

New genetic testing procedures for monogenic and polygenic traits developed from this project are being used by the beef and dairy industries to make selection decisions. Improved selection procedures saves beef and dairy farmers money and increases the value of seedstock.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes

Brief Explanation

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

1. Evaluation Studies Planned

- Retrospective (post program)

Evaluation Results

Key Items of Evaluation

Program #5

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	15%		15%	
302	Nutrient Utilization in Animals	15%		15%	
303	Genetic Improvement of Animals	0%		10%	
305	Animal Physiological Processes	0%		15%	
307	Animal Management Systems	25%		10%	
311	Animal Diseases	20%		15%	
315	Animal Welfare/Well-Being and Protection	20%		15%	
806	Youth Development	5%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	14.0	0.0	18.0	0.0
Actual	11.8	0.0	24.3	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
579946	0	1135554	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
478700	0	1135554	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
4014461	0	13698107	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub goal "To develop management practices that enhance efficiency of production by food producing animals" included an experiment conducted to determine the effect of dietary energy content on internal [visceral] fat accumulation in non-lactating dairy cows [these data lead to a change of knowledge about the most appropriate way to feed dairy cows during the dry period]; several research projects conducted to evaluate the interactions of genetics and environment/nutrition on muscle development and adiposity [findings increased our knowledge of the interactions between the genetics of the animal and the management systems that we impart onto them]; and the development of financial and economic information evaluating year-around grazing systems [this system has been shown to decrease cost by over $100 per cow compared to economic analysis of traditional systems].

Activities under the sub goal "To develop nutritional and management practices that optimize health of domestic animals" included improvement in pig health that was repeatedly found when feeding rice immediately after weaning [this has the potential to bring very important benefits in animal well-being and in the efficient use of the earth's resources in producing pork for the world's people]; as well as a study of the use of corn fibers to provide an economical and abundant source of dietary fiber which may also serve as a replacement for beet pulp in pet food diets.

Activities under the sub goal "To develop management practices that enhance animal well-being and minimize impact of animal production on the environment" included work that has established for the first time in the U.S. a detailed description of the conditions on a typical swine trailer during journeys from the farm to the packing plant; continued development of the elusieve process, a combination of sieving and elutriation [aspiration] to separate DDGS into enhanced and fibrous fractions [fractionating DDGS into fibrous and enhanced products using this process provides opportunities for differential uses and pricing of the products]; and a continuing study designed to provide researchers with a valuable and reliable tool to assess body temperature of pigs and potentially other physiological measures that can adequately assess animal well being.

Activities under the sub goal "To improve methods for diagnosis, prevention and treatment of infectious diseases in food animals" included a study designed to infer population structure and animal movement from genetic information to clarify the relative contribution of direct and environmental components of Chronic Wasting Disease; research using genomic sequencing and allied analyses to identify critical epitopes for an effective polyvalent PRRS vaccine; and the development of analytical procedures that can be offered as standard diagnostic tests for fumonisin toxicity.

Conferences and presentations by Investigators under this planned program in 2008 included the Joint Meeting of the American Dairy Science Association and the American Society of Animal Science, Colorado Dairy Nutrition Conference, Mid-South Ruminant Nutrition Conference, Animal Science and Reciprocal Meats Conference, American Society of Animal Scientists, American Simmental Association, International Society for Stem Cell Research, Australian Equine Science Symposium, International Animal Health and Nutrition Symposium, Mexican Association of Swine Veterinarians, Carolina Swine Nutrition Conference, and the Western Poultry Disease Conference.

The use of technology is a growing delivery system for Extension programs addressing animal production and health. The Illinois Livestock Trail website is the key source for a wealth of information related to livestock production. MarketMaker, an interactive web-based 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 300,000 profiles of farmers and other food-related enterprises in Illinois, Iowa, Georgia, Mississippi, Nebraska, Kentucky, Michigan, Mississippi, Indiana, Ohio, and New York that can be mapped and queried by users. Illinois Horse Breeders Short Course, Illinois Dairy Days, and Pet Extravaganza are examples of programs delivered by Extension staff to audiences at campus and off-campus sites. In addition, 1,326 Illinois 4-H and FFA members completed the Quality Assurance and Ethics Certification training and quiz for 2008 for beef, dairy, goats, horses, sheep and swine. This year’s annual report will focus on livestock grazing programs and programs targeted at swine producers and horse owners.

There are 2,900 swine operations in Illinois and ~600 commercial pork operations which list swine as a major source of business income. The production of these companies makes Illinois the 4th largest pork production state in the U.S. Specific Extension educational programming related to swine production included the two-day Illinois Pork Expo seminars that address management issues such as manure, disease, and animal welfare; the Northern Illinois Swine Reproduction Conference which includes translation for the Hispanic workforce of information on health, nutrition, and environment of the swine breeding herd; and the Pork Quality Assurance Plus training, which is required training in order to market pigs for human consumption. Web-based information and distance training is also available for producers who have free access to online courses focused on integrating new technologies into production systems and helping producers get through tough economic times. Web-based information and a calculator on feeding distillers dried grains with solubles also provide research-based information.

Using input solicited via questionnaires from horse owners regarding instructional needs, seminars were offered in Extension offices in several locations. Topics for the Illinois Horse Management Seminars included health care, horse industry economic update, riding opportunities on federal lands, equine dentistry, saddle fitting techniques, equine research at the University, "Ask the Vet" Q&A, feed selection during shortages, "Hot Equine Topics" Q&A , pasture management, and manure management. Lectures, question and answer sessions, and panel discussions were used as delivery methods.

2. Brief description of the target audience

Beef producers, animal scientists, livestock producers, custom manure haulers, regulatory agency representatives, livestock commodity group representatives, undergraduate students in Animal Sciences, veterinarians, animal science professionals, horse owners and breeders, dairy producers, the livestock feed industry, companion animal owners, community leaders, 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	61000	58500	28000	4600
2008	43772	31955	32287	0

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	2

Patents listed

Two patents were submitted in 2008, numbers 61/042,505 and 61/127560.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	1	84	
2008	0	75	75

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of completed research projects.

Year	Target	Actual
2008	19	7

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	Assisting Cattle Producers In Improving Production Efficiency While Also Minimizing Costs
4	Assisting Producers In Maximizing Profitability Of Feedlot Cattle
5	Utilization Of Waste Management Tools Such As The Illinois Manure Management Plan Workbook And Website
6	Knowledge Utilized To Ensure Meat Produced Is Safe For Consumption
7	Increased Knowledge Of Livestock Care And Management
8	Utilization Of Information On Livestock Grazing Management

Outcome #1

1. **Outcome Measures**

Program participants will exhibit/report KASA changes.

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

Number demonstrating/reporting behavior changes including improved decision-making

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

Assisting Cattle Producers In Improving Production Efficiency While Also Minimizing Costs

2. **Associated Institution Types**

•1862 Research

3a. **Outcome Type:**

Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

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

Issue (Who cares and Why)

There are several alternative technologies available that can increase cattle performance or reduce input costs of forage based beef production systems. How these technologies affect other aspects of the total beef system [eg. animal performance, fertilizer needs, water quality, purchased feed, grazing time, amount of harvested feed, and equipment needs], however, are not completely understood. We propose to study year round beef production systems for cow/calf producers. Detailed records will be kept so that economic analyses of the systems can be conducted.

What has been done

We studied year round beef production systems for cow/calf producers. Cattle grazed crop residues and deferred pasture when possible in the winter to reduce input costs for harvested and supplemental feedstuffs. Crossbred cows and their calves with similar genetic potential were utilized in these systems. The relative economic value of each of the grazing systems was determined by calculating revenue and costs associated with each system. Only costs that vary due to differences in the systems were considered. These costs include fertilizer, legume seeding, supplemental feed supplies, hay harvest costs for excess pasture growth, and any other practice associated with the different management practices among the grazing units.

Results

The financial and economic information developed by evaluating year around grazing systems has provided information that can be used to: 1) help producers improve production efficiency while lowering production costs, 2) serve as a key to beef industry educators in deciding what production and management areas are a concern and where educational programs can be developed to help producers, and 3) help producers set realistic goals. This system has been shown to decrease cost by over $100 per cow compared to economic analysis of traditional systems.

4. **Associated Knowledge Areas**

KA Code	Knowledge Area
307	Animal Management Systems

302	Nutrient Utilization in Animals

Outcome #4

1. Outcome Measures

Assisting Producers In Maximizing Profitability Of Feedlot Cattle

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

With current technology, for every bushel of corn fermented 18 lbs of dry distillers grains are produced. Fermenting 3.15 billion bushels of corn will produce approximately 28 million tons of distillers grains annually. Ruminants are best equipped to efficiently utilize distillers grains because of its high fiber content and amino acid profile reflecting corn protein. Practical inclusion rates will be 10-15% of most swine and poultry diets. Because swine and poultry have few alternatives to grains for energy and because they have superior feed efficiencies to ruminants, they will outbid ruminants for a limited corn supply. Consequently, to maintain food production capacity, ruminant diets based entirely on co-products or a combination of treated crop residues and distillers grains must be developed.

What has been done

Data from 828 steers by Simmental or Angus sires [n=47] were analyzed to evaluate effects of feed efficiency on profitability. Cattle were fed corn or distillers grains based diets [n=11] and marketed on three strategies: live price, quality grade [Quality grid], and yield grade [Yield grid]. Five year average price data were collected for feedstuffs, live cattle price, dressed beef price, and grid premiums and discounts. Feed efficiency had a dramatic effect on profitability across all three marketing systems. Marbling score [MS], hot carcass weights [HCW], and yield grade [YG] were similar across the range of F:G ratios. Diets containing distillers grains were more profitable than those based on corn.

Results

These data show the relative importance of diet, genetics [sire], and market option on profitability of feedlot cattle. Distillers grains as a repalcement for corn increased gains, reduced costs of gain, and improved profitability under the economic assumptions of this study.

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
302	Nutrient Utilization in Animals

Outcome #5

1. Outcome Measures

Utilization Of Waste Management Tools Such As The Illinois Manure Management Plan Workbook And Website

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This project studies improvements of livestock waste management and emissions control in two contexts, specific technologies and the overall impact of livestock production on the surroundings. Technologies studied include improved mapping of liquid manure application, refined vegetative filters for treating feedlot runoff water, specific capture-and-treat technologies for swine confinement ventilation exhaust air [especially advanced biofilters], and thermochemical conversion of swine manure solids into a crude oil product to reduce manure's pollution potential and provide an alternative fuel. The project will also help develop tools for describing the overall effect of livestock and poultry production at the larger scales of ecosystem, regional, national, and global. Tools will include models and universal 'building blocks' that enable livestock and poultry production and subsystems to be entered into life-cycle analysis and related systems-analysis procedures.

What has been done

A continuous thermochemical conversion process for making crude oil product from animal wastes and other agricultural by-products has been licensed to private companies and is nearing commercialization. A pilot plant is under construction for converting swine manure solids to oil. New protocols for describing the products of hydrothermal processing were developed. Various GPS mapping strategies for towed-hose applicators and tanks were evaluated and refined. An Extension team worked with commercial manure haulers to identify a low cost system for as-applied mapping of manure application in crop fields. Results were presented in training sessions to custom manure haulers and to livestock producer audiences. Proprietary systems for reduction of emissions from swine wean-to-finish confinement buildings were tested. A set of five similar swine buildings on a single farm - one control and two sets of two buildings for treatments - were instrumented with continuous air sampling equipment. Final data analysis showed the effectiveness of the emission control systems, and results were delivered to the sponsor of the research. Biofilter packing materials and an innovative trickling biofilter were evaluated for their effectiveness in controlling ammonia emissions from swine buildings. The Illinois Manure Management Plan website [www.immp.uiuc.edu] was further developed and training sessions were held to encourage producers and consultants to implement the IMMP planning and recordkeeping tools.

Results

The thermochemical conversion process has the potential to produce up to fifteen U.S. gallons of crude oil product per finishing pig raised. The process can be used on a variety of wet feedstocks to produce oil products. Livestock producers have better information regarding the selection of, and investment in, emission control technologies based on the results of the field tests. Approximately 1,000 Illinois livestock producers now have a reporting and recordkeeping tool, the Illinois Manure Management Plan Workbook and website, which will help producers meet compliance guidelines with existing and new water quality regulations. The IMMP tools will be useful to Illinois livestock facilities of all sizes.

4. Associated Knowledge Areas

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

Outcome #6

1. Outcome Measures

Knowledge Utilized To Ensure Meat Produced Is Safe For Consumption

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	3619

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Restaurants, food retailers and consumers are concerned about the safety of the food consumed in light of periodic food borne illness outbreaks; producers are concerned about management challenges in meeting these expectations while achieving a profitable enterprise.

What has been done

University of Illinois Extension staff members serve as Pork Quality Assurance Plus advisors and trainers for pork producers to achieve certification in PQA Plus. As PQA Plus advisers, Extension staff can also provide pork production site assessments that ensure that pigs are raised in environments where they receive humane care and are free of ingestion or injection of substances of harm to humans who consume the meat products when animals are marketed. In addition, Extension provides training in food safety, antibiotic use, and animal well-being awareness for youth pork producers of ages eight to 18 followed by a certification test. Recertification is required periodically for producers and advisors.

The Northern Illinois Swine Reproduction Conference is held each spring. Attendance by producers and their workforce numbered 84 this past year. Translation is provided for Hispanic workforce attendees. Topics focused on health, nutrition, and environment of the swine breeding herd. An evaluation was distributed and completed by thirty-four of this year's attendees.

Results

Currently Illinois has 76 individuals certified as advisors, 1,867 certified adult producers, and 1,657 certified youth producers. In addition, 113 pork production sites have been assessed and certified for a three year period.

In response to the evaluation question asking attendees to list 'What information presented today is valuable to you', attendees mentioned more than once the following information: 1) all or most of it; 2) sow management; 3) artificial insemination/semen handling; 4) farrowing/parturition management: 5) heat checking; 6) health signs; 7) assessment of animals/facilities; 8) improving boar contact/stimulus; and 9) gilt information/induction.

4. Associated Knowledge Areas

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

Outcome #7

1. Outcome Measures

Increased Knowledge Of Livestock Care And Management

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	141

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Horse owners have a wide range of experience and interest in owning horses remains high. Both new and experienced horse owners find horse ownership to be an expensive proposition requiring information on managing health care, nutrition, feed selection, and other equine research topics.

What has been done

Seminars were offered in Extension offices in several locations. Lectures, question and answer sessions, and panel discussions were used as delivery methods. Topics for the Illinois Horse Management Seminars included health care, horse industry economic update, riding opportunities on federal lands, equine dentistry, saddle fitting techniques, equine research at UI, 'Ask the Vet' Q&A, feed selection during shortages, 'Hot Equine Topics' Q&A, pasture management, and manure management. There were 250 horse-owning clients that attended these seminars and 188 surveys of program satisfaction and knowledge changes were collected. A sample of six post-seminar surveys was used to prepare this report.

Results

Some seminar evaluations ranked program helpfulness on a scale from 1-5 as follows: 1=Great, 2=Good, 3=Okay, 4=Fair, and 5=Poor, while other evaluations rated pre- and post-lecture subject matter knowledge as Excellent, Good, Average, Fair, or Poor, and some evaluations ranked pre- and post-seminar subject matter knowledge on a scale from 1-7 [low to high]. One hundred forty-one of 154 attendees who completed the evaluation quantified at least one level of improvement in knowledge in surveys that were quantitative in nature. Proper feeding and health care were the focus of several of the seminars, important topics in controlling expenses of horse ownership were also featured, and were specifically mentioned or measured in evaluations. Examples of areas of knowledge increase from pre to post test include: 1) buying and evaluating hay [12 of 17 individuals--70%] with 10 [59%] indicating they plan to better inspect hay when they purchased it; 2) wound care 12 of 27 [44%]; and 3) feet and teeth care 11 of 27 [41%].

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

Utilization Of Information On Livestock Grazing Management

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	47

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

For a number of years a team of Extension staff with expertise in crops systems, agricultural engineering, and animal systems have worked together to enhance grazing knowledge and practices of Illinois livestock producers via face-to-face and distance education. The team assisted by Extension's Director of Program Planning and Assessment designed an online evaluation to gather feedback on practices Extension users had implemented with respect to livestock grazing. The survey was opened in January of 2008 and promoted via media, commodity groups' communication outlets, and at Extension livestock programs.

Results

Seventy individuals who have used information provided by Extension on livestock grazing visited the survey site with between 44 and 53 providing answers to various questions. Although a larger response rate would have been preferred [perhaps through more aggressive promotion of participation such as announcements/computer availability at Extension programs], Illinois Extension livestock grazing educational areas of emphasis are being implemented by livestock producers to maximize pasture grazing productivity, specifically rotation based on forage height, animal carrying capacity, and soil testing of paddocks. Producers' addition of new or improved forage types is also notable. Finally, results would indicate that those practices have enhanced the length of the grazing season and reduced the use of supplemental feed, thus supporting respondents' indication that they have experienced an increase in economic return per grazed acre. [See detailed description of practice changes in the Evaluation section of this Planned Program.]

4. Associated Knowledge Areas

KA Code	Knowledge Area
307	Animal Management Systems
302	Nutrient Utilization in Animals

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

1. Evaluation Studies Planned

- Retrospective (post program)

Evaluation Results

For a number of years a team of Extension staff with expertise in crops systems, agricultural engineering, and animal systems have worked together to enhance grazing knowledge and practices of Illinois livestock producers via face-to-face and distance education. The team assisted by Extension's Director of Program Planning and Assessment designed an online evaluation to gather feedback on practices Extension users had implemented with respect to livestock grazing. The survey was opened in January of 2008 and promoted via media, commodity groups' communication outlets, and at Extension livestock programs.

Seventy individuals who have used information provided by Extension on livestock grazing visited the survey site with between 44 and 53 providing answers to various questions. Respondents were involved in a variety of livestock enterprises with slightly over half being beef cow-calf producers. Other respondents' enterprises included beef finishing, beef stockers, dairy heifers or cows, goats, sheep, horses, poultry, and swine. The enterprises were located in all three sections of the state—south, central, and north.

When asked to check livestock grazing management practices changed as a result of Extension programming or information provided by Extension, 47 responded. Results are as follows:

64% increased the number of pasture paddocks
57% increased the rate at which they rotated livestock based on forage height
47% now match livestock numbers to pasture carrying capacity
43% started using temporary electric fencing
40% increased stockpiling of forages
38% increased soil testing of pasture paddocks
36% enrolled in a government cost share program
34% installed or improved in-pasture watering systems
34% installed permanent, high tensile electric fencing
2% enrolled in a carbon offset program

When asked to indicate new or improved types of forages recommended by Extension, 37 of 51 [72%] of respondents to the question indicating that they had done so. Most frequently checked were legumes [25], brassicas [19], and cool season grasses [17]. In response to questions related to extending the grazing season, 43 of 53 [81%] respondents indicated that they had done so with approximately half indicating extension of an additional two months on average. Nearly 90% of the respondents [44 of 49] to the question related to reduction of hay or other supplemental feed required indicated they had been able to do so. Forty-four of 48 respondents [91%] also indicated that they have experienced an increase in economic return per acre with 16 of those selecting the response "most years" or "all years."

Key Items of Evaluation

Although a larger response rate would have been preferred [perhaps through more aggressive promotion of participation such as announcements/computer availability at Extension programs], Illinois Extension livestock grazing educational areas of emphasis are being implemented by livestock producers to maximize pasture grazing productivity, specifically rotation based on forage height, animal carrying capacity, and soil testing of paddocks. Producers' addition of new or improved forage types is also notable. Finally, results would indicate that those practices have enhanced the length of the grazing season, and reduction of supplemental feed, thus supporting respondents' indication that they have experienced an increase in economic return per grazed acre.

Program #6

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	50%		50%	
206	Basic Plant Biology	10%		10%	
402	Engineering Systems and Equipment	25%		25%	
601	Economics of Agricultural Production and Farm Management	15%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	0.0	0.0	4.0	0.0
Actual	0.6	0.0	2.1	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
31634	0	97236	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
26111	0	97236	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
218971	0	775826	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub goal "Providing fuel and materials for sustainability" included use of microfiltration of thin stillage prior to evaporation to impact energy use, maintenance costs, and efficiency of evaporators; a study to investigate the viability of using butanol as a diesel fuel [butanol could be used as a blend with diesel fuel or biodiesel to help reduce viscosity, density, and surface tension and improve each fuel's atomization characteristics]; and work to increase the rate of fermentation and ethanol produced per batch to improve ethanol plant productivity as well as reduce energy inputs.

Activities under the sub goal "Improving biofuel production and carbon sequestration" included an analysis of how to increase acres for ethanol production without displacing food crops [options include harvesting Conservation Reserve Program [CRP] acres or converting them to row crops] and research designed to identify and promote the most effective commercial production methods for the biomass feedstock Miscanthus x giganteus.

Activities under the sub goal "To develop a research base that will allow for the development of management systems that efficiently and economically produce bioenergy crops" included the discovery of a new soybean cyst nematode metabolic pathway as a first step in the process of developing a sustainable method of SCN control; development of a new technique that will allow for the rapid identification of plants with differing chromosome composition to test for biomass production; and research designed to benefit the biotechnology industry and soybean producers by providing basic information on gene regulation in soybean, specifically of the flavonoid pathway and potentially in several important developmental pathways including the formation of cell walls, leaves, and trichomes.

Conferences and presentations made by Investigators under this planned program in 2008 included the International Conference on Membranes and Membrane Processes, Corn Utilization and Technology Conference, Society of Automotive Engineers, American Society of Agricultural and Biological Engineers, U.S. Department of Energy [DOE] Working Group Workshops on Homogenous Charge Compression Ignition, Deere and Company, South African Institute of Agricultural Engineers, American Association of Cereal Chemists, International Grain Quality and Technology Congress, Sustainable Bioenergy: Focus on the Future of Biofuels and Chemicals Workshop held in Champaign, American Society of Agronomy, Crop Science Society of America, and the Soil Science Society of America.

Extension annually conducts 2-day regional Crop Management Conferences each year in various locations in the state to focus on topics of concern to 370 producers and Certified Crop Advisers.This year’s general sessions focused on agricultural environment issues.One of these general sessions titled *Current Biofuels Research Progress at UIUC and Environmental Implications of Corn Ethanol Production* was presented by an Extension Specialist in Bioenvironmental Engineering.

2. Brief description of the target audience

Corn processors, plant breeders, the ethanol production industry, commodity producers, dry grind ethanol companies, engineering and consulting firms, policy makers, researchers, students, crop producers, certified crop advisers, and Extension educators.

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	0	0	0	0
2008	881	338	857	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	1

Patents listed

One patent was submitted in 2008, number 61.090,014.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	19	
2008	0	36	36

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of completed research projects.

Year	Target	Actual
2008	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
2008	6	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. Despite recent declines in petroleum prices, strategies involving development of alternative and renewable energy sources are being driven by national security and environmental concerns [in particular global warming].

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. Efforts are underway to deconstruct cell wall [biomass]. It is anticipated that when cellulosic biomass can be deconstructed in an economically viable environment, that second generation biofuels will take on important significance with respect to the total portfolio of liquid fuels.

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. While there have been some individual recent reports on solving the cellulosic deconstruction bottleneck, this has not yet translated to commercial applications and will likely take some additional years to work through the pipeline to commercialization.

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
601	Economics of Agricultural Production and Farm Management

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
2008	35	45

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

While the load on the engine influenced performance, the NOx emissions from soybean and rapeseed biodiesel combustion were higher than diesel regardless of load on the engine. The combustion model used in this study was GT-Power, a well established commercially available engine combustion model. Recently the ability to simulate exhaust aftertreatment has been added to the model and a study of the effect of biodiesel on particulate filters has been initiated. The fuel property library generated for biodiesel will provide a unique opportunity to investigate the performance of the aftertreatment system with biodiesel. As the project is about studying the impact of biofuels, an investigation has begun into the use of butanol as a compression ignition fuel.

Results

Previously butanol has been seen as a potential replacement for gasoline with not much attention being focused on its use in diesel engines. The purpose of this study was to investigate the viability of using butanol as a diesel fuel. Analysis of the viscosity, density, and surface tension of ethanol, butanol, diesel fuel, and soybean biodiesel, which are very important atomization properties, showed that butanol lies in between ethanol and diesel fuel for all three properties. Butanol could be used as a blend with diesel fuel or biodiesel to help reduce viscosity, density, and surface tension and improve each fuel's atomization characteristics. Biodiesel could see the greatest improvement in atomization characteristics when blended with butanol as its properties of viscosity, density, and surface tension are larger than diesel fuel. The heat of combustion and cetane number of ethanol, butanol, diesel fuel, and soybean biodiesel was also investigated.

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 Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	100

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 imputs]. We have focused on comparing two crops, Miscanthus and switchgrass.

Results

Work now completed in fact shows that we have already reached our 2013 goal. Trials were conducted on a new biomass grass crop Miscanthus x giganteus in side-by-side comparison with the switchgrass cultivar recommended for Illinois. These were the first replicated trials of Miscanthus x giganteus in the U.S. They showed an average dry harvested biomass yield of 29.6 metric tons per hectare for Miscanthus compared to 10.2 t/ha for switchgrass, so almost 200% more - based on 3 years of trials at 3 sites across Illinois.

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

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

Program #7

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%		60%	
802	Human Development and Family Well-Being	5%		10%	
803	Sociological and Technological Change Affecting Individuals, Families and Communities	5%		10%	
805	Community Institutions, Health, and Social Services	5%		10%	
806	Youth Development	5%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	15.0	0.0	3.0	0.0
Actual	20.0	0.0	3.6	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
980636	0	156171	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
809438	0	156171	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
6788088	0	347848	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub goal "Studying community activism, mobilization and leadership in rural communities to assist in developing strong institutions that will foster revitalization of rural life" included continued involvement in river restoration and in community economic development efforts along the Mississippi and Illinois Great Rivers; research that strives to understand the processes and impacts of migrant families sending remittances, focusing on immigrants in non-metropolitan areas of the Midwest [the current phase of the project has centered on institutions, entrepreneurship, and development]; work on the role of water operators in implementing Source Water Protection is being considered as a model of Well Head Protection and Source Water Protection by the Illinois EPA and the Illinois Section AWWA; work on evaluating community water governance has led to an initiative by the Illinois Section AWWA and University of Illinois Extension to develop a program on community water board training; and continued investigations into the importance of rural farmer's markets [for example, we found recognition of the importance of the social aspects of farmers' markets even among respondents who did not purchase locally grown food].

Activities under the sub goal "Studying teaching and learning in agricultural education programs in order to improve science education instruction" included a continuing study designed to investigate the perceived effectiveness of innovative technologies to enhance teaching and learning [one significant aspect of this project was to present an assessment of a series of instructional activities that were developed and implemented to improve the basic knowledge level of students entering technical systems management undergraduate level classes].

Conferences and presentations by Investigators under this Planned Program in 2008 included The Rural Sociological Society Annual Conference and The American Water Works Association Annual Conference.

Extension activities include a wide variety of methods and focus 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 members working in this area are currently identifying priority activities as well as impact evaluation plans.

Illinois Resources Net [IRN] is a funding access initiative providing Illinois nonprofits and local governments with the competitive assets to access federal funding. IRN offers organizations a unique approach to grant access centered on providing information and resources on an interactive website and working with experienced technical assistants to develop quality funding proposals. In partnership with the University of Illinois at Chicago and the Great Cities Institute, University of Illinois Extension staff members [employed through the University of Illinois at Urban-Champaign] provide technical assistance to nonprofits and local governments.

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, 425 county officials have registered for classes. An orientation for newly elected officials and financial symposiums for county treasurers are examples of some of the courses offered each year; others are designed to address current issues.

Community Assessment and Development Services [CADS] and Community Matters are programs that aim to enhance the ability of communities and organizations to make decisions using current, reliable, and relevant data. CADS provides a statewide system of professionals trained in applied research methods which strengthens the University's outreach to businesses, organizations, and local governments. Examples of CADS programming components include: questionnaire design, surveys, focus groups, strategic planning, feasibility studies, asset mapping, and demographic profiles.

Other Extension programs include Customers First—Service is Key!, U-Facilitate, and Engaging Generations targeted for businesses and organizations, Going Solo [guiding aspiring entrepreneurs into the world of business ownership], Poverty Simulation [designed to help youth and/or adult participants understand what it might be like to live in a typical low-income family trying to survive month-to-month], and Tomorrow's Leaders high school curriculum [designed to develop citizens who care about and contribute to their communities]. Working collaboratively with Kentucky, Missouri, Arkansas, and Tennessee Extension, Illinois hosted the multi-state New Madric Seismic Zone Earthquake Preparedness Conference in May in Metropolis, Illinois attended by 100 interested officials and citizens with coverage by three major media networks.

2. Brief description of the target audience

Latinas and Latinos, financial/economic/consumer educators, Extension educators [field based], community leaders interested in building local food systems, farmers growing or interested in growing food for local consumption, institutional food buyers [restaurants, schools, governmental agencies, hospitals, and nursing homes], and food entrepreneurs. Additional Extension audiences include community leaders, business 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

	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Year	Target	Target	Target	Target
Plan	21000	0	500	0
2008	38103	30660	14344	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	16	
2008	0	12	12

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of research projects completed.

Year	Target	Actual
2008	3	2

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	Measuring The Effectiveness Of Innovative Technologies To Enhance Teaching And Learning
4	Increase The Amount Of Federal Funding Secured By Illinois Organizations And Municipalities By $25 Million Over The Course Of Three Years

Outcome #1

1. **Outcome Measures**

Number of individuals demonstrating KASA and related changes.

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

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

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

Measuring The Effectiveness Of Innovative Technologies To Enhance Teaching And Learning

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The overall goal of this project is to investigate the perceived effectiveness of innovative technologies to enhance teaching and learning. One significant aspect of this project was to present an assessment of a series of instructional activities that were developed and implemented to improve the basic knowledge level of students entering technical systems management undergraduate level classes. Many of the students enrolling in the technical systems management classes do not have the same level of fundamental understanding of the basic principles and knowledge level in technical systems management.

What has been done

A series of instructional activities were developed to provide students opportunities to learn the fundamentals as they start and progress through the classes. These instructional activities were primarily web-based and offered as supplemental instructional activities that did not require formal instructional time. These activities included instructional topics such as tool and components identification, safety practices, fundamental scientific principles, and application of instructional practices. The primary goal of these activities was to provide an opportunity for those students who do not have the expected entry level of fundamental knowledge to develop a baseline of competence. Another aspect of this project was to develop an outcome assessment program for the undergraduate and graduate Agricultural and Biological Engineering programs and the undergraduate Technical Systems Management education programs in the Department of Agricultural and Biological Engineering.

Results

The expected impact of this project has been the implementation and improvement of instructional activities at both the undergraduate and graduate levels for technical systems management education. Another impact has been the development and utilization of student surveys to assess the relative perceptions of effectiveness of the education program in Agricultural and Biological Engineering and Technical Systems Management. The data collected has been used to improve existing educational programs and to develop three new undergraduate courses. This project has provided research to enhance the technical systems management curriculum and instructional activities. New curriculum options have been developed and existing courses have been enhanced as a result of this investigation. Undergraduate student enrollments in selected technical systems management classes have increased as an outcome of this project.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Increase The Amount Of Federal Funding Secured By Illinois Organizations And Municipalities By $25 Million Over The Course Of Three Years

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	2007488

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Federal funding is available to address and support a variety of issues facing local communities. An analysis of federal funding accessed through grant applications revealed that Illinois has not been successful in securing federal funding, due to: 1) lack of knowledge of how to find and apply for grants, 2) competition with other organizations for funding, 3) lack of staffing resources, 4) lack of proposal writing skills, and 5) lack of knowledge about fundraising planning.

What has been done

This first year of the Illinois Resource Net [IRN] project involved designing and setting up major project systems including staffing, outreach methodology, organizational assessment procedures, program design, curriculum development, web design, data collections and storage systems, communications strategies, and evaluation design. During this year, new resource development tools have been provided to approximately 5,580 individuals and organizations through conferences, newsletters, websites, and direct contacts. An evaluation of outcomes and process was also conducted.

Results

With IRN assistance, a total of 20 proposals for federal funding have been submitted. More than $2 million in federal funds has been awarded in response to those proposals with another $12,892,122 still pending. $47,540 has been awarded in state funding and another $173,148 is still pending. Interviews or surveys completed with the main person responsible for preparing and submitting 18 of these 20 federal proposals indicated that they believed that the assistance they received met their expectations in the areas of reviewing and commenting on drafts, finding a funding source, preparing a plan to develop the proposal, assisting with budget, or organizing partners.

4. Associated Knowledge Areas

KA Code	Knowledge Area
805	Community Institutions, Health, and Social Services
802	Human Development and Family Well-Being
803	Sociological and Technological Change Affecting Individuals, Families and Communities

608 Community Resource Planning and Development

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Key Items of Evaluation

Program #8

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	15%		35%	
502	New and Improved Food Products	10%		30%	
503	Quality Maintenance in Storing and Marketing Food Products	0%		10%	
702	Requirements and Function of Nutrients and Other Food Components	0%		15%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	75%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	5.0	0.0	5.0	0.0
Actual	1.7	0.0	6.1	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
84356	0	724596	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
69629	0	724596	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
583922	0	1636284	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub goal "To determine form, stability, and/or function of food components and the effects of processing and/or stability of food or fiber" included continued development of ultrasound technology as a new food processing modality [with the goal of providing a promising alternative to traditional thermal food preservation methods, especially those dealing with liquid food processing]; experiments and the results from those experiments on the use of membranes in combination with sub-critical fluids to refine crude vegetable oils; use of sensory-directed flavor [aroma] analysis, such as combined gas chromatography-olfactometry and sensory descriptive analysis, to allow for the identification of key odorants in foods; modification of our inverse gas chromatography system with an atmospheric pressure chemical ionization mass spectrometer [APCI-MS] which allows us to be the first to study competitive binding and sorption parameters between multiple flavor compounds and soy protein; research that has focused on the chemistry of lipids in chocolate as affected by storage conditions and the translation of this into the impact on human perception of chocolate texture and flavor release; and transformation investigations that produced a 2,4-D tolerant wine grape, Improved Chancellor [this could facilitate large scale wine grape growing near grain crops encompassing states and regions previously unsuited to grape culture].

Activities under the sub goal "To determine chemical and/or microbial parameters related to chemical and/or microbial safety and/or stability of food and fiber" included the development of protocols for pretreatment of corn fibers using acidic and alkaline electrolyzed water at different temperatures and treatment times as well as research designed to develop best practices for both the standard saturated salt solution method and the new automated water sorption instruments and to comprehensively compare [including accuracy, precision, and uncertainty analysis] each of the new automated water sorption instruments to each other, as well as to the standard saturated salt solution method.

Conferences and presentations made by Investigators under this planned program in 2008 included the Annual Meeting of the Institute of Food Technologists, Institute of Food Technologists, Toxicology, and Safety Evaluation, Institute of Fuel Technologists, American Dairy Science Association, 2009 Conference of Food Engineering, American Chemical Society, Pennsylvania Manufacturers Confectioners Conference, and the Horseradish Grower’s School.

University of Illinois Extension provides food safety training annually to employees of establishments that prepare or serve food. The 5-hour Food Sanitation Refresher Course workshops conducted in 2008 helped 365 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 approximately 2,000 youth and their parents and teachers correct hand washing and cleanliness habits when preparing food. Information is shared through presentations in pre-schools, schools, and 4-H materials and workshops. Other activities include Serve It Safely presentations to 800 volunteers who serve food, and Master Food Preserver training [104 volunteers].

2. Brief description of the target audience

Scientists familiar with crop physiology and plant breeding, specifically those involved in trying to improve nitrogen use and nitrogen use efficiency of crop plants, persons interested in gastrointestinal function, soy food manufacturers, distributors, producers, scientists working with irradiation of meat products and the meat industry, and students and researchers in industry and academia interested in nanotechnology, biopolymers, protein self-assembly, tissue scaffolding, and microencapsulation. Extension programs target youth, certified food handlers, and volunteers who serve food to the public in communities for fundraisers, community organizations and family events [such as reunions and weddings].

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	76000	153000	88000	102000
2008	4169	2311	6067	0

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	1

Patents listed

One patent was submitted in 2008, 11,990,471.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	1	45	
2008	0	30	30

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of completed research projects.

Year	Target	Actual
2008	5	1

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	Using Aromoa Analysis To Develop Superior Food Manufacturing, Development, And Storage Processes
4	To Facilitate Large Scale Wine Grape Growing Near Grain Crops Encompassing States And Regions Previously Unsuited To Grape Culture
5	Monitoring Proper Temperatures Of Food Served To The Public To Prevent Foodborne Illnesses

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
2008	128000	91

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Lack of sanitary practices in handling food preparation can lead to the spread of disease and food contamination.

What has been done

Extension provides training for pre-school and elementary school youth through classroom presentations, summer cooking schools, day camps and 4-H workshops. Content focuses on proper hand washing and safe food preparation. This past year pre-tests and post-tests were used to evaluate increases in knowledge level of nearly 800 low-income 8-13 year-old participants in youth cooking schools held primarily in southern Illinois. One question on the evaluation focused on keeping hands clean.

Results

Ninety-one [11.7%] of the 777 youth cooking school participants who completed the pre-test and post-test increased the number of correct answers for items that addressed hand washing and sanitary food handling practices. However, of note, 86.8% of the youth answered all these items correctly on the pre-test indicating that they already knew a great deal about hand washing and safe food handling. No comparison of the participants who scored well and the locations where classroom presentations on proper hand washing are annually occurring has yet been made since results have just been tabulated. However, it would seem prudent to do some further investigation in order to use the data as indication of knowledge retention from previous Extension programming.

4. Associated Knowledge Areas

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

Outcome #2

1. Outcome Measures

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

Not reporting on this Outcome for this Annual Report

Outcome #3

1. Outcome Measures

Using Aromoa Analysis To Develop Superior Food Manufacturing, Development, And Storage Processes

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This research will develop and employ state-of-the-art methodologies for the investigation of aroma [odor]-active components of foods and ingredients. They will include the development and application of suitable methods for the isolation, separation, and identification of volatile aroma compounds. This will allow for development of higher quality food products by indicating important quality indices for product development/improvement and shelf-life estimation.

What has been done

The aroma-active compounds of American country ham and Jinhua were investigated by using direct solvent extraction-solvent assisted flavor evaporation [DSE-SAFE], dynamic headspace dilution analysis [DHDA], gas chromatography-olfactometry [GCO], aroma extract dilution analysis [AEDA], and gas chromatography-mass spectrometry [GC-MS].

Results

Use of sensory-directed flavor [aroma] analysis, such as combined gas chromatography-olfactometry and sensory descriptive analysis, allows for the identification of key odorants in foods. For example, the predominant aroma components of both country ham and Jinhua were shown to be derived from lipid oxidation, amino acid degradation, and Maillard/Strecker and associated reactions. These data can be used for the characterization of the aroma [flavor] of foods. In addition, these compounds can be monitored to evaluate shelf-life [quality markers] or used to examine the effect of processing and storage on product quality. This is turn can allow for development of superior manufacturing, processing, and storage practices.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
502	New and Improved Food Products

Outcome #4

1. Outcome Measures
To Facilitate Large Scale Wine Grape Growing Near Grain Crops
Encompassing States And Regions Previously Unsuited To Grape Culture

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Certain fruit and vegetable cultivars could be improved directly without a seed generation. Somaclonal variation has been implicated in many phenotypical changes in plants, and named cultivars have been released from somaclonal variation studies. Somaclonal variation will yield new plant types in a random manner. Transformation investigations are more direct and should yield 2,4-D tolerant lines directly. Improved forms of standard cultivars should be rapidly accepted by growers and producers and give good value to growers and consumers.

What has been done

We have spent many years studying methods to use somaclonal variation and transgenic technology to develop or improve unique fruit and vegetable cultivars. For instance, we used tissue culture to produce putative pure red and green clones of Comice pear from a red and green striped chimeral clone. Under Illinois conditions, the red clones produced red blushed fruits. With grapes we have developed and published methods to regenerate whole plants from single cells via somatic embryogenesis. We used these methods to introduce 2,4-D tolerance to Chancellor wine grape via transgenic procedures. One of the clones identified in this research has been named Improved Chancellor; a patent is in progress.

Results

Grapes are virtually intolerant of the herbicide 2,4-D. We have completed transformation investigations that produced a 2,4-D tolerant wine grape, Improved Chancellor. The cultivar is now growing in a secure greenhouse. We are seeking funds to field test this plant under USDA/biotechnology guidelines. Among the goals of a field test will be an investigation of the safety of the grape berries themselves as well as the wine made from this cultivar. If safe, Improved Chancellor could facilitate large scale wine grape growing near grain crops encompassing states and regions previously unsuited to grape culture. We expect that our cultivar may be rapidly accepted by growers and producers to provide good value to growers and consumers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
502	New and Improved Food Products
501	New and Improved Food Processing Technologies

Outcome #5

1. Outcome Measures

Monitoring Proper Temperatures Of Food Served To The Public To Prevent Foodborne Illnesses

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	125

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 in Nutrition and Wellness. Classroom presentations have been presented by professional and hourly staff to youth. A follow up evaluation was mailed this year to a random sample of 784 participants in Refresher Course for Food Handlers training conducted in 2006 and 2007.

Extension provides training for pre-school and elementary youth through classroom presentations, 4-H workshops, summer cooking schools, and day camps. Content focuses on proper hand washing and safe food preparation. This past year pre-tests and post-tests were used to evaluate increases in knowledge level of nearly 800 participants in youth cooking schools held primarily in southern Illinois. One segment of the test focused on food safety related items.

Results

Impact was collected from 206 [61.5% response rate] of those sampled participants [345 sample size]. Slightly more than 73% or 151 of the 206 respondents reported adoption of one or more of 18 food safety handling practices as a result of the training with 60.7% or 125 of the 206 respondents reporting changes in practices related to monitoring the temperature of the food they served. Most frequently mentioned were cooking and reheating microwaved protein food 25 degrees higher than conventional temperature; chilling ingredients for mixed food before combining; posting a consumer advisory if undercooked food is served; checking thermometers regularly for accuracy and recalibrate when needed; and using double strength sanitizing solutions in spray bottles. Additional information is provided in the final section of this planned program report.

Ninety-one [11.7%] of the 777 youth cooking school participants who completed the pre-test and post-test increased the number of correct answers for items that addressed hand washing and sanitary food handling practices. However, of note, 86.8% of the youth answered all these items correctly on the pre-test indicating that they already knew a great deal about hand washing and safe food handling. No comparison of the participants who scored well and the locations where classroom presentations on proper hand washing are annually occurring has yet been made since results have just been tabulated. However, it would seem prudent to do some further investigation in order to use the data as indication of knowledge retention from previous Extension programming.

4. Associated Knowledge Areas

KA Code	Knowledge Area
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins
501	New and Improved Food Processing Technologies

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Government Regulations
- Competing Programmatic Challenges

Brief Explanation

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

1. Evaluation Studies Planned

- Retrospective (post program)

Evaluation Results

In November of 2008, data were collected through mail questionnaires to verify whether or not the workshops helped participants improve food handling within their establishments. Subjects were selected through list sampling from recertification class rosters for the calendar years of 2006 and 2007.A total of 342 workshop participants were randomly sampled from a list of 784.Respondents were asked to remain anonymous.A second mailing of the questionnaire was made to all respondents in early January of 2009.Seven questionnaires were returned as undeliverable. A total of 206 [61.5%] of those who actually received surveys returned a questionnaire. The survey instrument asked about 18 food safety practices.Practices included cooking, reheating, holding temperatures, cooling practices, sanitation and personal hygiene.Participants could respond with "did prior to the refresher course," "done as a result of the course", and "not applicable."Also offered as responses, but not considered in this report was "plan to do" and "don't plan to do."

What were the areas where practices were improved? Between 30 and 40% of the participants *who found the question applicable* indicated that as a result of the Refresher Course for Food Handlers training that they now: 1) "Have an awareness of HACCP principles" [39.6% of 187 responding]. [HACCP refers to "Hazard Analysis Critical Control Points"and is an approach in which potential hazards are identified and controlled]; and 2) "Have an awareness of what bacteria need to grow" [39.2% of 186 responding].

In addition, between 30 and 40% of participants *who found the question applicable* indicated that they now practice the following as a result of the training: 1) "Cook and reheat microwaved protein foods 25 degrees higher than conventional temperature" [38% of 134 responding]; 2) "Chill ingredients for mixed food [example: tuna salad] before combining" [36.7% of 147 responding]; 3) "Post a consumer advisory if undercooked food is served" [34.7% of 75 responding]; 4) "Check thermometers regularly for accuracy and recalibrate when needed" [32.1% of 187 responding]; and 5) "Use double strength sanitizing solutions in spray bottles" [31.4% of 140 responding].

How many improved on one or more practice? Slightly more than 73 percent or 151 of the 206 respondents reported adoption of one or more improved food safety handling practices as a result of the training.Of that number slightly less than 60 percent or 125 of the 206 respondents reported adoption of one or more improved food safety practices related to monitoring proper food temperatures. Respondents reported adopting on average between three and four food safety practice behaviors [3.91].

To what extent did participants share what they had learned with others? One hundred eighty-three or about 95% of the respondents indicated they shared what they learned with others.Three out of four times this was with co-workers.Seven out of ten times it was with friends or family. Slightly over half shared the information with volunteers or friends who helped them.

Key Items of Evaluation

The results of a random follow-up survey with participants in the University of Illinois Extension Food Safety Recertification workshop indicate that this program does more than meet the continuing education requirements for food handlers to remain certified.Nearly three-fourths of the respondents reported improving their actual food handling with between three and four improved behaviors being reported on average. Nearly 61 percent reported improving food temperature monitoring practices.Based on the information on the conservative number of meals participants reported serving daily [100] and the annual number of food handlers trained on average per year [350] Extension training helps ensure that an estimated 35,000 meals per day are free of contaminants that can cause food borne illnesses.

Program #9

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	90%		80%	
803	Sociological and Technological Change Affecting Individuals, Families and Communities	10%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	9.0	0.0	3.0	0.0
Actual	13.7	0.0	7.0	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
664302	0	206839	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
548329	0	206839	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
4598382	0	1601228	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub goal "Studying the factors that enhance or hinder resilience in families in order to create programs and policies that will foster healthy families" include continued development of a web-based self-study of the curriculum for couples participating in life management courses; the More Fun with Sisters and Brothers Program curriculum has been refined and extended and now contains additional strategies and tools for enhancing children's sibling competencies, particularly in the areas of perspective-taking, emotion regulation, and conflict management; a project examining variations in co-parenting relationships for divorced mothers who experienced violence during their marriages [the results of the study contributed to a change in knowledge about factors that contribute to effective co-parenting after violence]; and work that is generating knowledge about what stressors are faced by lesbian and gay parents [and their children] who live in nonmetropolitan communities, the ways in which they respond to these issues, and the support that they would like to see developed in their communities.

Activities under the sub goal "Studying the processes of positive social and emotional development in children and adolescents in order to develop ways in which parents and other adults can foster healthy development" included the ongoing implementation of the Child Development Laboratory [CDL] Research Database Project [this project is designed to facilitate an interdisciplinary, longitudinal, and programmatic research agenda at the CDL]; and a project with the overall goal of deepening our understanding of how schools impact racial/ethnic and class differences in student achievement and school-related attitudes and behaviors during elementary school [the results thus far indicate that schools may be able to reduce racial/ethnic and socioeconomic differences in student achievement by creating academic and social environments which foster school-related attitudes and behaviors necessary for school success].

Conferences and presentations by Investigators under this Planned Program in 2008 included The National Extension Relationship and Marriage Education Network and The Father Involvement Research Conference.

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 [newsletter, brochures, etc.].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 printing materials.The program is marketed by Extension offices using promotional materials developed by the Family Life Team of Extension Educators.

Partners in Parenting is a statewide project funded by USDA’s Children, Youth, and Families at Risk [CYFAR] program.Through a community collaboration approach to support systems change in communities located in Cook County and four sites in southern Illinois, the program offers parents of newborns: 1) basic child development and parenting information; 2) guided activities designed to promote positive parenting; and 3) support for seeking additional information and resources from their community through local resources and program opportunities.Networking with other local agencies is an important component of this program.

Intentional Harmony is a multidimensional curriculum that was designed to increase knowledge of the causes, correlates, and outcomes of work-life stress, reduce the experience of work-life stress, and increase the use of adaptive work-life management strategies among program participants. 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.

Other Extension activities include Your Young Child, a research-based curriculum and customized brochures that help parents of infants and toddlers manage seven difficult stages and behaviors that are linked to child abuse and neglect; Caregiving Relationships workshops; the Parenting Again newsletter series for grandparents raising grandchildren; a Latino Childcare Video/DVD; and Nurturing Creativity DVD and lesson guide for child care providers.

2. Brief description of the target audience

Researchers as well as developers of educational and intervention programs, policy makers, professionals who work with women and their families affected by violence, policy makers and service providers concerned with building strong communities and families [and in particular African-American families], lesbian and gay parents and their children living in downstate Illinois, child care professionals, parents, professionals working with children and families, families with young children living in rural and suburban communities, the academic fields of sociology, education, and psychology, and educational education practitioners [i.e., principals and teachers].

Extension is also focusing on individuals who work for pay and parents/grandparents of newborns in communities where at least 20% of the population lives in households with incomes below the poverty level and meet at least 50% of the following characteristics: 1) family qualifies for public assistance program; 2) family income falls below the poverty threshold: 3) family income is less than 75% of the state or county median income; 4) a parent did not complete high school; and 5) youth/family on record with community juvenile justice and law enforcement or social service agencies for various risk indicators.

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	14600	247000	2100	1000
2008	24628	24915	11162	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	7	
2008	0	12	12

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of completed research projects.

Year	Target	Actual
2008	3	1

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	To Pinpoint Risk Factors And Underlying Processes That Contribute To Children's Peer Difficulties
4	To Understand The Factors That Contribute To Effective Co-Parenting After A History Of Intimate Partner Violence
5	To Educate Working Couples About Managing The Stresses Of Work While Maintaining Their Intimate Relationship
6	Number Of Research Projects Utilizing The Child Development Laboratory Research Database
7	Identifying The Stressors And Coping Strategies Of African American Families
8	Knowledge Of Child's Behaviors And Development
9	Increased Confidence And Competence In Functioning As A Parent
10	Increased Parenting Practices That Promote Nurturing Relationships
11	Reduction In Physical Strain And Emotional Strain From Balancing Work And Personal Life

Outcome #1

1. **Outcome Measures**

Number of persons demonstrating or reporting KASA changes.

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

Number of persons reporting or demonstrating behavior changes.

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

To Pinpoint Risk Factors And Underlying Processes That Contribute To Children's Peer Difficulties

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. **Outcome Type:**

Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

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

Issue (Who cares and Why)

Because patterns of problematic interactions with peers begin to emerge during the preschool years and have implications for children's subsequent adjustment, it is important to pinpoint risk factors and the underlying processes that may contribute to children's peer difficulties. The overarching objective is to examine affective-cognitive biases as mechanisms through which the parent-child attachment relationship may be associated with children's functioning in the friendship realm.

What has been done

In Study One, children's hostile attribution biases were examined as mediators of longitudinal associations between mother-infant attachment classifications at age one and friendship outcomes during the early school years. Study Two expands upon this work by assessing children's and parents' affective-cognitive biases and their associations with parent-child attachment relationships. Furthermore, the interpersonal processes through which children may develop affective-cognitive biases in the context of parent-child interactions are explored. To date, outputs from this project include activities related to data collection and data analysis, as well as training of graduate and undergraduate students in observational research methodologies, data management, and statistical techniques. Results have been disseminated widely via press releases, newsletters to participating families, and presentations at teacher training workshops.

Results

Findings from the above projects aim to increase our knowledge of the mechanisms through which early family relationships are related to children's functioning in the peer realm. Results, to date, suggest that child-mother attachment security at age three is associated with later friendship competence via mother-child open emotional communication, child language ability, and children's processing of social information. These findings may have important implications for early prevention and intervention for children at-risk for social-emotional disturbance and problematic peer relationships.

4. **Associated Knowledge Areas**

KA Code	Knowledge Area

802	Human Development and Family Well-Being

Outcome #4

1. Outcome Measures

To Understand The Factors That Contribute To Effective Co-Parenting After A History Of Intimate Partner Violence

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Intimate partner violence is a significant factor in many women's decision to divorce. However, divorce does not always stop the violence. Women with children may be at particular risk for ongoing violence if they must share custody and parenting responsibilities with the abuser after divorce. This study seeks to explore the post-divorce parenting experiences of women and their children when there is a history of IPV.

What has been done

The results of this project have been disseminated to national, state, and local audiences, including meetings for the Illinois Center for Violence Prevention, the National Council on Family Relations, and the Child Care Resource Service of the University of Illinois.

Results

The purpose of this project was to examine variations in coparenting relationships for divorced mothers who experienced violence during their marriages. The results of the study contributed to a change in knowledge about factors that contribute to effective coparenting after violence. The results indicated that how well former husbands were able to differentiate, or keep separate, their parental and spousal roles emerged as central to coparenting dynamics and was partly related to type of marital violence. Linking differentiation to types of marital violence advances our theoretical understanding of variations in coparenting relationships after divorce. Results can be used to more effectively match divorcing parents with appropriate interventions.

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

To Educate Working Couples About Managing The Stresses Of Work While Maintaining Their Intimate Relationship

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

We have developed an evidence-based program, Intentional Harmony: Managing Work and Your Relationship, to educate working couples about managing the stresses of work while maintaining their intimate relationship. This curriculum now must be evaluated for effectiveness. The proposed project involves a full-scale evaluation project, including recruitment and assignment to control or intervention group, program delivery and follow-up, and collection of outcome data over a one-year period.

What has been done

We have created a draft of a web-based self-study of this curriculum. The principle investigator has created a blog to disseminate information related to the project. It is updated monthly with accessible, research based information. For additional information please see http://web.extension.uiuc.edu/hmw/lovenotes/.

Results

The project evaluation is actively on-going. We have done three community workshops and have a total of 30 couples so far in the study. The principle investigator joined a national group of Extension Specialists in the National Extension Specialists Relationship and Marriage Education Network. The group spearheaded a successful grant proposal to the Administration for Children and Families. We are charged with writing a curriculum on marriage for professionals who work with couples.

4. Associated Knowledge Areas

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

Outcome #6

1. Outcome Measures
Number Of Research Projects Utilizing The Child Development Laboratory Research Database

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{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 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

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

Outcome #7

1. Outcome Measures

Identifying The Stressors And Coping Strategies Of African American Families

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The goal has been to identify chronic stressors in the lives of low-income, African American families living in inner-city neighborhoods and the coping strategies used to address these stressors.

What has been done

Findings have emerged concerning family coping strategies: Family routines are related to perceptions of neighborhood dangers and access to resources. The quality of family relationships [e.g., cohesion] and the nature of social support from extended kin impacted on the ability of families to manage the stressors associated with neighborhoods with limited resources and multiple dangers. Inquiries into nutrition, health, and well-being highlight the role of neighborhood setting. Neighborhoods pose constraints on families' access to safe recreational facilities and high quality foods found in large grocery stores. Families' ability to maintain good physical health through recreation and dietary practices are, in part, related to managing neighborhood constraints, such as locating quality grocery stores outside of the local neighborhood and participating in recreational activities in safe neighborhood niches.

Results

From a substantive perspective, the research will 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. From a theoretical perspective, the forthcoming findings should contribute to theories of family resilience. Such findings will expand on general theories of resilience by noting the importance of ethnic-racial family subcultures and neighborhood context.

4. Associated Knowledge Areas

KA Code	Knowledge Area

802	Human Development and Family Well-Being

Outcome #8

1. Outcome Measures

Knowledge Of Child's Behaviors And Development

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	69

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. For those parents considered 'at-risk' there are additional barriers to participation in programs including lack of convenient and affordable transportation and child care, as well as lack of awareness of information to help parents of newborns manage seven difficult stages and behaviors that are linked to child abuse and neglect.

What has been done

The Parenting 24/7 website, Just in Time Parenting newsletters, and Your Young Child parenting programs and brochures provided information designed to help parents feel confident and empowered during developmental stages, to manage their stress, to understand normal child behavior, to have realistic expectations, and to develop positive workable parenting strategies. An evaluation was conducted using the Partners in Parenting registration form for parents of 'at-risk' newborns and newsletter surveys including an instrument developed by the eXtension Community of Practice for evaluating knowledge gains attributable to age-paced newsletters.

Results

Evaluations were distributed to 287 participants who have received one year of newsletters through the Partners in Parenting program with 81 respondents [another 71 returned as undeliverable]. In terms of knowledge gained, over 85% [69] of the participants who returned the survey 'agreed or 'strongly agreed' that the newsletters helped them learn to: 1) know what to expect my baby to be able to do at each age; 2) understand that some annoying things my baby does are normal for that age; 3) notice my baby's clues; 4) have more ideas about ways I can play with my baby to help him/her learn; 5) have more ideas about disciplining my child without spanking or slapping; 6) understand that my baby is not trying to be bad or to make me mad on purpose; 7) know when my baby is hungry and full; and 8) know when to schedule well-baby checkups an take my baby in for immunization.

4. Associated Knowledge Areas

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

Outcome #9

1. Outcome Measures

Increased Confidence And Competence In Functioning As A Parent

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	122

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. For those parents considered 'at-risk' there are additional barriers to participation in programs including lack of convenient and affordable transportation and child care, as well as lack of awareness of information to help parents of newborns manage seven difficult stages and behaviors that are linked to child abuse and neglect.

What has been done

The Parenting 24/7 website, Just in Time Parenting newsletters, and Your Young Child parenting programs and brochures provided information designed to help parents feel confident and empowered during developmental stages, to manage their stress, to understand normal child behavior, to have realistic expectations, and to develop positive workable parenting strategies. An evaluation was conducted using the Partners in Parenting registration form for parents of 'at-risk' newborns and newsletter surveys including an instrument developed by the eXtension Community of Practice for evaluating knowledge gains attributable to age-paced newsletters.

Results

Evaluations were distributed to 287 participants who have received one year of newsletters through the Partners in Parenting program with 81 respondents [another 71 returned as undeliverable]. Eighty-six percent [70] of survey returnees 'agreed' or 'strongly agreed' that they felt more confident in their skills as a parent from reading the newsletter, 89% [72] said they now felt more comfortable talking with their doctor when they had a question or concern, and 86% [70] said they now knew when to schedule well-baby checkups and immunizations. Using previous evaluations of Parenting 24/7 website users, 40 users experienced increased confidence in parenting this year.

4. Associated Knowledge Areas

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

Outcome #10

1. Outcome Measures
Increased Parenting Practices That Promote Nurturing Relationships

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	55

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. For those parents considered 'at-risk' there are additional barriers to participation in programs including lack of convenient and affordable transportation and child care, as well as lack of awareness of information to help parents of newborns manage seven difficult stages and behaviors that are linked to child abuse and neglect.

What has been done

The Parenting 24/7 website, Just in Time Parenting newsletters, and Your Young Child parenting programs and brochures provided information designed to help parents feel confident and empowered during developmental stages, to manage their stress, to understand normal child behavior, to have realistic expectations, and to develop positive workable parenting strategies. An evaluation was conducted using the Partners in Parenting registration form for parents of 'at-risk' newborns and newsletter surveys including an instrument developed by the eXtension Community of Practice for evaluating knowledge gains attributable to age-paced newsletters.

Results

Evaluations were distributed to 287 participants who have received one year of newsletters through the Partners in Parenting program with 81 respondents [another 71 returned as undeliverable]. When asked how much impact reading the newsletter had on using specific parenting practices, between 45-68% said it helped them to do these things 'more' or 'quite a bit more' than what they would have done without the newsletters: 1) provide opportunities for my baby to explore and learn [68%]; 2) try different ways to calm my baby and help my baby stop crying [56%]; 3) feed my baby safe and healthy food [55%]; 4) have patience when my baby is fussy or does something annoying [56%]; 5) be less angry when my baby is difficult [45%]; 6) talk and listen to my baby [57%]; and 7) show my baby books and pictures [45%]. Forty-six percent of the respondents said the newsletter had helped them to find information or check websites for more information and 42% [34] said that it helped them talk about parenting with others.

4. Associated Knowledge Areas

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

Outcome #11

1. Outcome Measures

Reduction In Physical Strain And Emotional Strain From Balancing Work And Personal Life

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	42

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Dual-earner couples have become more common in the last 20 years, and they currently form the largest segment of the U.S. workforce. This means that most workers are married to or partnered with someone who also is employed. However, most 'occupational career paths remain predicated on single-earner per family template.' This lack of support for dual-earners can create difficulties in couple relations, and stresses at work can spill over into the intimate-partner relationship at home. At home, stressed individuals are more likely to withdraw from interactions with their partner, and the interactions that they do have may be less nurturing and sensitive than they would have been were they not feeling stressed. Work stress spillover can lead to decreased marital satisfaction, inattentiveness to the needs of family members, conflicts, and sometime, even family dissolutions.

What has been done

The Intentional Harmony: Managing Work and Life curriculum was designed to increase knowledge of the causes, correlates, and outcomes of work-life stress, reduce the experience of work-life stress, and increase the use of adaptive work-life management strategies among program participants. Six modules correspond to managing work and six domains of non-work life and consist of: 1) work and parenting; 2) work and relationships with a partner or spouse; 3) workplace stress [workplace relationships]; 4) work and emotional well-being; 5) work and physical health; and 6) work and extended family and friends. The modules have been taught many times to a variety of audiences [668 adults]. A formative evaluation of one Intentional Harmony module--Managing Work and Partner--is in progress and consists of a pre- and post-test. The design includes an intervention group [currently 7 couples] and a control group [currently 10 couples] that does not receive the workshop until after the post-test.

Results

The preliminary data document four indicators of program success. Intervention participants demonstrated markedly more improvement than control participants from pre-workshop to post-workshop evaluations: (1) intentionally making time for fun and relaxing couple activities [29% of the intervention participants improved compared to 16% of the control group] and (2) intentionally engaging in behaviors that exhibit sensitivity to partner [29% of participants improved compared to 11% of the control group]. In addition, after the workshop, participants were asked to reflect on their knowledge change and their intended behavior change and to rate these items on a 5-point scale [1=strongly disagree to 5=strongly agree]. Participants' ratings averaged 4.3 on knowledge gained ['I leaned a great deal in the program']. Ratings averaged 4.1 on intended behavior change ['I gained information, skills, or techniques that I will use in my life'].

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Competing Public priorities
- Competing Programmatic Challenges
- Populations changes (immigration,new cultural groupings,etc.)
- Other (Mobility of program 'at-risk' participants)

Brief Explanation

Challenges exist in tracking practice changes by those who visit websites that experience webpage views.Efforts are being made to find ways to do so for Parenting 24/7 website users that have grown from 4,574 webpage views in September 2005 to 57,583 in February of 2009.

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

1. Evaluation Studies Planned

- Retrospective (post program)
- Before-After (before and after program)
- Time series (multiple points before and after program)
- Comparisons between program participants (individuals,group,organizations) and non-participants

Evaluation Results

Parenting 24/7 programming was awarded the 2008 National Extension Association for Family and Consumer Sciences Florence Hall Award.The Florence Hall Award is presented for an outstanding program conducted by one or more NEAFCS members who have been alert in recognizing new concerns and interests of families and have involved people in planning and implementing programs that benefit families.The application received the maximum possible score from judges, and was described as " a thoughtfully developed resource, making the best use of technology to meet parents' needs with up-to-date information—a great example of Extension teamwork in action."

Key Items of Evaluation

Program #10

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	5%		20%	
701	Nutrient Composition of Food	0%		10%	
702	Requirements and Function of Nutrients and Other Food Components	0%		10%	
703	Nutrition Education and Behavior	50%		20%	
704	Nutrition and Hunger in the Population	15%		20%	
723	Hazards to Human Health and Safety	20%		10%	
724	Healthy Lifestyle	10%		10%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	0.0	5.0	0.0
Actual	32.9	0.0	5.8	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
1602760	0	574869	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1322952	0	574869	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
11094509	0	1792034	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub goal "To determine the effects of dietary and environmental factors on human health and disease" include cell culture and piglet studies to determine whether soy isoflavone could reduce the ability of rotavirus to infect cells; development of an improved lycopene extraction method from tomato cell culture that provides plant scientists, food scientists, and natural product chemists with an optimized method for lipophilic compound extraction [and thus enhance our understanding of potential mechanisms of how tomato carotenoids improve health outcomes]; a study that showed that both low protein and high fructose affects insulin signaling pathway and adiposity, indicating a profound effect of macronutrient composition on energy metabolism [understanding the mechanism of macronutrient effects on fat deposition and energy metabolism will contribute to improving dietary recommendations for optimal health]; and a study which has shown that fresh broccoli contains a cofactor that causes ingested glucoraphanin to form inactive nitrile in place of bioactive sulforaphane - and that steaming for 2-4 minutes can destroy the cofactor without destroying the myrosinase enzyme, thus enhancing sulforaphane production from a broccoli meal.

A significant investment of Extension's effort is focused on helping limited resource families and youth improve knowledge of nutrition practices through the Family Nutrition Program and developing materials that are shared through the Wellness Ways website. Specific programs developed and offered to youth include "Get Up and Move," a series of meeting guides that can be used with youth groups that include brief nutrition and physical activity information, physical activities, and healthy snacks focused on increasing youths' physical activity to 60 minutes per day and the "Healthy Moves for Healthy Children" program focused on helping pre-schoolers to encourage motor skill development and healthy snacking. "Live Well Be Well" is new program in the pilot stage that addresses holistic self-management for adults with any type of ongoing health condition[s]. The program meets once a week for six-seven weeks and is taught by trained lay-leaders and professionals.

A number of Extension programs focus on chronic diseases including osteoporosis, heart disease, and diabetes. "Dining with Diabetes" was taught as a three-part Extension program that combines lecture, food demonstrations, activities, and samples of healthy foods. In addition, a second series "Eating Well with Diabetes," a three-part program following the format of Dining 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. A bi-monthly newsletter "Diabetes Lifelines" is sent via mail to over 10,000 subscribers including agencies. Two websites also make information available to the public. The "Your Guide to Diet and Diabetes" site provides information in both English and Spanish to clientele on a variety of diabetes-related topics at http://www.urbanext.uiuc.edu/diabetes2[over 27,000 hits per month]. The "Diabetes Recipes" website had 169,045 visits to the English site and 217,608 visits to the Spanish website during the 2007-2008 program year at http://www.urbanext.uiuc.edu/diabetesrecipes/ .

2. Brief description of the target audience

Parents, physicians, the soy industry, infant formula manufacturers, the medical and nutrition communities, individuals with chronic malabsorption, fiber producers/manufacturers around the country, producers and consumers of organic foods, the general public who have interests in tomato products and prostate cancer, plant scientists, food scientists, natural product chemists who work on secondary metabolite production and plant tissue extraction, and adults with type two diabetes. Extension programming focused on consumers and youth, especially those with limited resources, Spanish-speaking, or dealing with chronic diseases.

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	291000	608000	342000	408000
2008	786679	87750	587899	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	27	
2008	0	18	18

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of completed research projects.

Year	Target	Actual
2008	5	3

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	Improving Patient Compliance With Long-Term Insulin Therapy
4	Increased Knowledge Of Safe And Nutritional Food Preparation Skills
5	Increased Knowledge Of Types Of Foods That Affect Blood Glucose Level

Outcome #1

1. **Outcome Measures**

Number demonstrating or reporting KASA changes.

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

Number demonstrating or reporting behavior changes.

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

Improving Patient Compliance With Long-Term Insulin Therapy

2. **Associated Institution Types**

•1862 Research

3a. **Outcome Type:**

Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

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

Issue (Who cares and Why)

The prevalence of type 2 diabetes [T2D] has risen dramatically in the last 20 years and the cost of care for diabetes and its complications is significant, easily exceeding $100 billion per year. Critical to the development of T2D and its complications is inflammation, but how this pro-inflammatory state arises and how it affects the brain and behavior in individuals with diabetes is not clear.

What has been done

We have now shown that leptin is critical to innate immune activation because it is required for hypoxia recovery. Whatever the cause of acute hypoxia, the obesity/T2D epidemic makes it much more likely that acute hypoxia will occur in the obese/T2D individual. In fact, certain hypoxia-associated disorders like asthma, heart failure, and sleep apnea are linked to obesity. Our new work now shows why obese/diabetic db/db [leptin receptor defective] mice and ob/ob [leptin deficient] mice have prolonged recovery from acute hypoxia because by enhancing IL-1RA production leptin promoted sickness recovery from hypoxia. In addition, we found that hypoglycemia causes social withdrawal, and that this adverse behavior is dependent on catecholamines via a beta-2 receptor-mediated pathway.

Results

The importance of these findings is tied to treatment of T1D and T2D [which is often insulin requiring in older patients with long standing disease]. Insulin injection frequently leads to hypoglycemia and hypoglycemia causes sickness symptoms. This link between insulin, hypoglycemia, and sickness may be the reason why patient compliance to long term insulin therapy is problematic.

4. **Associated Knowledge Areas**

KA Code	Knowledge Area
724	Healthy Lifestyle
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety

Outcome #4

1. Outcome Measures

Increased Knowledge Of Safe And Nutritional Food Preparation Skills

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	642

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Youth lack skills in preparing safe and nutritional foods.

What has been done

Youth cooking schools have been conducted annually for 8-13 year olds using the format of 5 half days of 'hands-on' educational activities that include food safety, basic nutrition, and food preparation. The targeted audience is youth from low-income families. Pre- and post-test were developed and collected from 777 youth participants this past year asking them to indicate their perceived level of knowledge or skill related to following seven areas: 1) following directions in a recipe, 2) measuring ingredients, 3) handling a sharp knife, 4) using kitchen tools and equipment, 5) using a stove or oven safely, 6) keeping hand clean, and 7) reading food labels. [Answer choices were 'I have not learned or am just learning to do this', 'I can do this but need more practice', 'I can do this easily by myself.'

Results

Pre- and post-test results indicated that of the 777 youth participants in cooking schools who completed pre- and post-tests, 82.6% [642] indicated perceived improvement in at least one of the seven areas of focus. Of the remaining youth, 15.1% indicated they could already easily do all things listed on the pre-test. When examining the number of youth who perceived that they increased their skill after the cooking school, findings indicated that 44.3% increased post-test skills related to following recipes; 43.1% increased measuring skills; 37.6% increased skill in handling a sharp knife; 33.3% increased kitchen tools/equipment use skills, 49.5% increased skill in using the stove/oven; and 33.7% increased skill in reading food labels. Food sanitation/hand washing skills perception increased for only 11.7 % of the youth participants, but must be interpreted in light of pre-test responses that indicated that 86.8% of the youth felt they could easily do this before the cooking session began.

4. Associated Knowledge Areas

KA Code	Knowledge Area
703	Nutrition Education and Behavior
723	Hazards to Human Health and Safety

Outcome #5

1. Outcome Measures

Increased Knowledge Of Types Of Foods That Affect Blood Glucose Level

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	211

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 2007-2008 program year, over 1,200 adults were involved in programs related to diabetes. The 'Dining with Diabetes' three-part training that incorporated soy information and recipes reached 179 participants. 'Dining with Diabetes' was also conducted with a group of 32 Spanish speaking participants.

Results

Participants in the soy-focused 'Dining with Diabetes' increased attitudes and knowledge about and wanted more recipes with soy and more experience in using soy in menus. The Spanish-speaking participant group [32] increased knowledge about diabetes per pre- and post-test results, lost weight, and improved blood glucose.

4. Associated Knowledge Areas

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

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Appropriations changes
- Competing Programmatic Challenges

Brief Explanation

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

1. Evaluation Studies Planned

- Before-After (before and after program)

Evaluation Results

Evaluation results are given in the indicator on increased knowledge of safe and nutrional cooking skills [for youth].

Key Items of Evaluation

Program #11

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	30%		30%	
112	Watershed Protection and Management	18%		25%	
123	Management and Sustainability of Forest Resources	5%		15%	
133	Pollution Prevention and Mitigation	12%		10%	
405	Drainage and Irrigation Systems and Facilities	5%		10%	
605	Natural Resource and Environmental Economics	10%		5%	
806	Youth Development	20%		5%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	14.0	0.0	20.0	0.0
Actual	10.7	0.0	12.7	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
516679	0	668153	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
426478	0	668153	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
3576520	0	2093296	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub goal "Ensuring environmental friendliness and resource utilization efficiency" included developing a base-flow model calibrated with data collected from two tile-drained watersheds in east central Illinois [the data resulted in improved understanding of the impact of subsurface drainage in hydrology and water quality]; new analytical methods were developed for simultaneous detection of multiple target pharmaceuticals and pesticides via high performance liquid chromatography coupled with continuous liquid scintillation counting [these methods can greatly reduce the cost and analytical effort associated with bench-scale treatability studies using natural waters spiked with pharmaceuticals and pesticides]; and research that will, for the first time, provide a comprehensive description of the physical, chemical, and biological properties of particulate matter emitted from typical confinement livestock buildings.

Activities under the sub goal "Best utilizing insect management in agricultural cropping systems" included release of two species of microsporidia pathogenic to the gypsy moth via infected gypsy moth larvae at two natural area sites in McHenry County, Illinois [the goal of the study is to establish the microsporidian species in the host populations and determine persistence of the pathogen]; and, through plant breeding and selection, impatiens lines with improved levels of resistance to western flower thrips were identified [improved impatiens lines are in trials with several seed companies in 2009 and companies growing impatiens as spring bedding plants have expressed interest in these improved lines and have agreed to evaluate them during 2009].

Activities under the sub goal "Minimizing agricultural impacts on the environment" included the creation of nutrient criteria for all rivers and streams in Illinois [the State of Illinois is using information and ideas from this project as the basis for the criteria it is developing]; research results from wetland samples collected from throughout Illinois demonstrating that composition and denitrification activity of microbial communities in constructed wetlands differs significantly from the microbial communities found in natural wetlands; and data produced by the National Atmospheric Deposition Program National Trends Network that continues to provide the only long-term nationwide record of wet deposition in the United States.

Conferences and presentations by Investigators under this planned program in 2008 included the International Livestock Environment Symposium, Gulf Hypoxia and Local Water Quality Concerns Workshop, American Society of Agricultural and Biological Engineers, American Water Works Association Research Foundation, Gateway Industry Green Conference, American Society for Horticultural Sciences, Illinois Specialty Crops Conference, Society of Wetlands Sciences, Illinois State Academy of Sciences, Ecological Society of America, International Symposium on Microbial Ecology, and the American Society of Limnology and Oceanography.

Extension activities focused on tillage systems and soil and water management. Tillage seminars are offered yearly in multiple locations in the state to highlight research findings and adoption of no-till and strip-till farming methods to produce high yields while controlling soil erosion and protecting water quality.Soil and water workshops were held on two different dates at a total of eight locations statewide using a combination of live presenters and teleconferencing with Power Point slides.

Extension staff members also organize five state-wide audio-conferences every year. Subjects include pond establishment and management, tax assessment on agricultural land, rain gardens, green initiatives for communities, and energy conservation. County offices are encouraged to host the audio-conferences and recover costs through client registration.

Illinois-Indiana Sea Grant developed a resource kit and held workshops to help communities start unwanted medicine take-back programs and tools to help communities develop collection programs for electronic waste to keep contaminants such as mercury from ending up in lakes and rivers. In addition, McLean County Master Gardeners have been joined by six other counties to recycle plastic garden pots at local nurseries.

The Illinois Master Naturalist [ILMN] program is in the pilot stages and provides science-based educational opportunities that connect people with nature and help them become engaged environmental stewards. ILMN partners with a variety of statewide and local businesses, agencies, and organizations that share or support a natural resource education and stewardship ethic. Evaluation tools are being developed to measure future impact of this new program.

Extension activities associated with conserving water and preserving the quality of water resources include an online study guide for individuals wishing to pass the licensing exam for installation and maintenance of private waste water treatments, leadership for planning the Governor’s Biennial Conference on the Management of the Illinois River System; and Master Gardener assistance in creating the Chicago Museum of Science and Industry’s Smart Home: Green and Wired garden/landscape that demonstrates water conservation through recycling storm water runoff into landscape irrigation. Over 100,000 people visited the exhibit to date which will remain open through 2009.

Extension activities also included online courses for Certified Crop Adviser required continuing education units and conservation days conducted for youth.

2. Brief description of the target audience

Research and extension communities, watershed management groups, local producers, urban and rural land owners/managers, drainage contractors, livestock producers, water and wastewater utilities, government regulation agencies related to air quality and animal facilities, industry related to air quality control technologies, Midwestern Cornbelt producers, crop consultants, agricultural/Extension professionals, research scientists, staff, policy makers and land managers who are concerned with the consequences of crop and fertilizer management, wetland researchers, natural resource managers, and pond managers. The Illinois-Indiana Sea Grant hazardous waste collection program targeted community officials and groups.

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	10100	180	15400	3060
2008	35091	14917	29649	0

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

Patent Applications Submitted

Year	Target
Plan:	1
2008 :	0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	90	
2008	0	31	31

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of completed research projects.

Year	Target	Actual
2008	20	7

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	Improving Nutrient Criteria For Rivers And Streams In Illinois
4	Assessing The Ecological Impacts Of Hg Pollution In Agricultural Watersheds
5	Dissemination Of Air Quality And Atmospheric Deposition Data Through Web Hits On The NADP Website
6	Number Of Drainage Water Management System Acres
7	Aspirations To Increase Strip-Till And No-Till Crop Production
8	Knowledge Of Healthy Soils [Carbon, Phosphorus, Nitrogen] And Soil Testing
9	Knowledge Of Soil Recycling And Reclamation
10	Investigated Or Purchased Crop Production Guidance Systems
11	Planted Strip-Till Or No-Till Crops
12	Use Of Soil Testing And Improved Application Of Fertilizer Or Organic Matter To Maintain Soil Nutrient Balances
13	Knowledge Of Pond Establishment And Management
14	Proper Disposal Of Hazardous Waste By Communities

Outcome #1

1. Outcome Measures

Program participants will report/demonstrate KASA changes.

Not reporting on this Outcome for this Annual Report

Outcome #2

1. Outcome Measures

Participants will demonstrate behavior changes including improved decision-making.

Not reporting on this Outcome for this Annual Report

Outcome #3

1. Outcome Measures

Improving Nutrient Criteria For Rivers And Streams In Illinois

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Agricultural fields in Illinois contribute nitrate and phosphorus to streams from both surface runoff and tile flow, which has led to degraded water quality. This project examines how various concentrations and forms of these nutrients affect stream algal production, dissolved oxygen, and in turn biotic integrity.

What has been done

Results from this project have been presented to all interested groups in Illinois and have influenced the development of nutrient criteria. Presentations during the last year were made to agricultural producers, environmental groups at water quality forums, and to wastewater treatment agency personnel, all of whom have an interest in improving water quality in Illinois. In addition, presentations were made nationally to illustrate the complexity of controlling nutrients in agricultural streams of the Midwest.

Results

The outcome that has been affected by this work is in the creation of nutrient criteria for all rivers and streams in Illinois. The State of Illinois is using information and ideas from this project as the basis for the criteria it is developing. The results of this project have had a major impact on these criteria, which will have major economic affects for the agricultural community as well as for sewage treatment plants in the state.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation
405	Drainage and Irrigation Systems and Facilities
605	Natural Resource and Environmental Economics

Outcome #4

1. Outcome Measures

Assessing The Ecological Impacts Of Hg Pollution In Agricultural Watersheds

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Methylmercury accumulates in freshwater fish to levels that are one million-fold higher than in the water. The mercury comes from atmospheric deposition, but must be methylated before it can accumulate in fish. The balance of Hg methylation and demethylation in watersheds and the degree of bioaccumulation therefore determine the mercury levels in fish, which determines the exposure of people and wildlife to Hg. Our objective is to investigate the processes that lead to the accumulation of mercury in fish in streams, rivers, and lakes of agricultural watersheds.

What has been done

This year we have focused on completing a high quality dataset of concentrations of methylmercury and inorganic mercury in streamwater from Piasa Creek near Alton, IL. The database will be used for modeling Hg in the Piasa Creek watershed and for assessing the ecotoxicological impacts of Hg pollution in this agricultural watershed. In addition, we have been continuing our method intercomparison work. The evidence is growing that our new method more effectively extracts methylmercury - the most toxic form of mercury in the environment - from water than the standard method.

Results

Our research is contributing to advances in knowledge on two fronts. First, we are obtaining the most accurate sets of data to date for methylmercury in water samples. Once interpreted using a model, the new data enable us to better understand how atmospheric deposition of Hg is transformed into methylmercury, the form of Hg that accumulates in food webs. Second, by comparing our method with the standard method, we have identified a major flaw in the existing methodology for analyzing methylmercury in water. Since this is the most toxicologically important form of Hg, this result has fundamental importance for the field of Hg biogeochemistry.

4. Associated Knowledge Areas

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

Outcome #5

1. Outcome Measures

Dissemination Of Air Quality And Atmospheric Deposition Data Through Web Hits On The NADP Website

2. Associated Institution Types

•1862 Research

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	1650000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The National Atmospheric Deposition Program National Trends Network provides the only long-term nationwide record of wet deposition in the United States. During FY08, this project coordinated and analyzed over 13,000 samples across the network and delivered these results to the NADP database.

What has been done

NADP's principal outcomes and impacts on the broader scientific and educational communities are reflected in the perceived value of our data products. Value: In its 2005 [most recent] report to Congress, the National Acid Precipitation Assessment Program cited the NADP as the 'primary air quality and atmospheric deposition monitoring program providing scientists and policymakers with robust data on the fate, transport, and deposition of air pollutants and on trends in acidic deposition and air quality in the United States.' Our data was also recognized in recent reports of the Binational Air Quality Committee of the U.S.-Canada Air Quality Agreement, U.S. EPA, and U.S. Forest Service.

Results

Our web site continues to be the primary data dissemination tool. This site received ~ 1.65 million web page hits, 90,000 unique visitors, and has about 37,900 registered users. Users retrieved 25,500 data files during 15,000 sessions, a continuing increase over FY07. Mercury data is approximately 15% of all downloads. About 33% of users are from federal and state agencies, 33% from universities, 20% from K to 12 schools, and the remainder from other organizations. These statistics demonstrate that NADP continues to be relevant to the scientific and educational communities.

4. Associated Knowledge Areas

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

Outcome #6

1. Outcome Measures
Number Of 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
2008	{No Data Entered}	3000

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

Nitrate loads in drain outflow from managed systems were reduced by over 60%. At least 39 Drainage Water Management Plans were developed, significantly increasing the acreage under 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
112	Watershed Protection and Management
102	Soil, Plant, Water, Nutrient Relationships
605	Natural Resource and Environmental Economics
405	Drainage and Irrigation Systems and Facilities

Outcome #7

1. Outcome Measures

Aspirations To Increase Strip-Till And No-Till Crop Production

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	74

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Illinois T-Transect Survey measures the progress which has occurred in reducing soil erosion to T or a tolerable soil loss level statewide. This was initially part of the T by 2000 program which was begun in 1982 as part of the Illinois Erosion Control Guidelines issued by the Illinois General Assembly. The tolerable soil loss for most soils is between 3 and 5 tons per acre per year. This is the amount of soil loss that can theoretically occur and be replaced by natural soil building processes. Reducing soil loss to T is essential in maintaining long-term agricultural productivity of the soil and to protecting water resources from sedimentation due to soil erosion. In addition, maintenance of soil productivity is dependent on understanding soil types and preserving nutrient content to support crop production.

What has been done

A total of 441 farm owners/operators, agribusiness owners, and agency staff attended the 2008 Illinois tillage seminars, with a theme of 'Tillage, Technology and Environmental Stewardship.' An evaluation was distributed to each of the attendees and 227 [51%] completed and returned the evaluation. Of this number 145 [64%] had previously attended a seminar and 82 [36%] had not. A total of 190 primarily Certified Crop Advisers attended 2008 soil and water workshops conducted using a combination of live presenters and teleconferencing with Power Point slides that covered information on: 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. An evaluation was distributed at the end of each program.

Results

Participants who attended the tillage seminars and completed the evaluation indicated specific changes or new techniques which they planned to incorporate into their farming operation in 2008 that included 70 participants [31%] who indicated aspirations to increase strip-till practices. Of the 40 Certified Crop Adviser participants in the soil and water workshops who returned an evaluation, four indicated that they will make recommendations to agricultural producers with whom they work that suggest tillage application and management changes.

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

Knowledge Of Healthy Soils [Carbon, Phosphorus, Nitrogen] And Soil Testing

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	25

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Illinois T-Transect Survey measures the progress which has occurred in reducing soil erosion to T or a tolerable soil loss level statewide. This was initially part of the T by 2000 program which was begun in 1982 as part of the Illinois Erosion Control Guidelines issued by the Illinois General Assembly. The tolerable soil loss for most soils is between 3 and 5 tons per acre per year. This is the amount of soil loss that can theoretically occur and be replaced by natural soil building processes. Reducing soil loss to T is essential in maintaining long-term agricultural productivity of the soil and to protecting water resources from sedimentation due to soil erosion. In addition, maintenance of soil productivity is dependent on understanding soil types and preserving nutrient content to support crop production.

What has been done

A total of 190 primarily Certified Crop Advisers attended 2008 soil and water workshops conducted using a combination of live presenters and teleconferencing with Power Point slides that covered information on: 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. An evaluation was distributed at the end of each program.

Results

Forty Certified Crop Adviser participants in the soil and water workshops returned an evaluation and 25 cited information regarding management changes that they will recommend to agricultural producers that they work with regarding proper nutrient application based on soil type and using organic matter instead of fertilizer and increasing soil testing to correct imbalances.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

Outcome #9

1. Outcome Measures

Knowledge Of Soil Recycling And Reclamation

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	11

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Illinois T-Transect Survey measures the progress which has occurred in reducing soil erosion to T or a tolerable soil loss level statewide. This was initially part of the T by 2000 program which was begun in 1982 as part of the Illinois Erosion Control Guidelines issued by the Illinois General Assembly. The tolerable soil loss for most soils is between 3 and 5 tons per acre per year. This is the amount of soil loss that can theoretically occur and be replaced by natural soil building processes. Reducing soil loss to T is essential in maintaining long-term agricultural productivity of the soil and to protecting water resources from sedimentation due to soil erosion. In addition, maintenance of soil productivity is dependent on understanding soil types and preserving nutrient content to support crop production.

What has been done

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Results

Forty Certified Crop Adviser participants in the soil and water workshops returned an evaluation and 11 cited information regarding management changes that they will recommend to agricultural producers on managing soil erosion and recycling/reclamation.

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
112	Watershed Protection and Management

Outcome #10

1. Outcome Measures
Investigated Or Purchased Crop Production Guidance Systems

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	62

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Illinois T-Transect Survey measures the progress which has occurred in reducing soil erosion to T or a tolerable soil loss level statewide. This was initially part of the T by 2000 program which was begun in 1982 as part of the Illinois Erosion Control Guidelines issued by the Illinois General Assembly. The tolerable soil loss for most soils is between 3 and 5 tons per acre per year. This is the amount of soil loss that can theoretically occur and be replaced by natural soil building processes. Reducing soil loss to T is essential in maintaining long-term agricultural productivity of the soil and to protecting water resources from sedimentation due to soil erosion. In addition, maintenance of soil productivity is dependent on understanding soil types and preserving nutrient content to support crop production.

What has been done

A total of 441 farm owners/operators, agribusiness owners, and agency staff attended the 2008 Illinois tillage seminars, with a theme of 'Tillage, Technology & Environmental Stewardship.' An evaluation was distributed to each of the attendees and 227 [51%] completed and returned the evaluation. Of this number 145 [64%] had previously attended a seminar and 82 [36%] had not.

Results

Participants who had attended a previous tillage seminar identified the following changes which they had made to their farming/tillage system based on previous years' presentations:

-Investigated or purchased guidance systems - 62 [48%] of those who returned an evaluation form

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships

Outcome #11

1. Outcome Measures

Planted Strip-Till Or No-Till Crops

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	81

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Illinois T-Transect Survey measures the progress which has occurred in reducing soil erosion to T or a tolerable soil loss level statewide. This was initially part of the T by 2000 program which was begun in 1982 as part of the Illinois Erosion Control Guidelines issued by the Illinois General Assembly. The tolerable soil loss for most soils is between 3 and 5 tons per acre per year. This is the amount of soil loss that can theoretically occur and be replaced by natural soil building processes. Reducing soil loss to T is essential in maintaining long-term agricultural productivity of the soil and to protecting water resources from sedimentation due to soil erosion. In addition, maintenance of soil productivity is dependent on understanding soil types and preserving nutrient content to support crop production.

What has been done

A total of 441 farm owners/operators, agribusiness owners, and agency staff attended the 2008 Illinois tillage seminars, with a theme of 'Tillage, Technology and Environmental Stewardship.' An evaluation was distributed to each of the attendees and 227 [51%] completed and returned the evaluation. Of this number 145 [64%] had previously attended a seminar and 82 [36%] had not.

Results

Participants who had attended a previous tillage seminar identified the following changes which they had made to their farming/tillage system based on previous years' presentations:

-Planted no-till crops - 60 [41%]

-Updating no-till/strip planters - 21 [14%]

4. Associated Knowledge Areas

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

Outcome #12

1. Outcome Measures

Use Of Soil Testing And Improved Application Of Fertilizer Or Organic Matter To Maintain Soil Nutrient Balances

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	31

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The Illinois T-Transect Survey measures the progress which has occurred in reducing soil erosion to T or a tolerable soil loss level statewide. This was initially part of the T by 2000 program which was begun in 1982 as part of the Illinois Erosion Control Guidelines issued by the Illinois General Assembly. The tolerable soil loss for most soils is between 3 and 5 tons per acre per year. This is the amount of soil loss that can theoretically occur and be replaced by natural soil building processes. Reducing soil loss to T is essential in maintaining long-term agricultural productivity of the soil and to protecting water resources from sedimentation due to soil erosion. In addition, maintenance of soil productivity is dependent on understanding soil types and preserving nutrient content to support crop production.

What has been done

A total of 441 farm owners/operators, agribusiness owners, and agency staff attended the 2008 Illinois tillage seminars, with a theme of 'Tillage, Technology & Environmental Stewardship.' An evaluation was distributed to each of the attendees and 227 [51%] completed and returned the evaluation. Of this number 145 [64%] had previously attended a seminar and 82 [36%] had not.

Results

Participants who had attended a previous tillage seminar identified the following changes which they had made to their farming/tillage system based on previous years' presentations:

-Used variable rate fertilizer application - 31 [24%]
-Increased soil testing [grid sampling] - 32 [22%]

Other practice changes included investigated/began carbon trading [18] and identified field costs/returns [17].

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
605	Natural Resource and Environmental Economics

Outcome #13

1. Outcome Measures

Knowledge Of Pond Establishment And Management

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	30

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Contacts by owners/managers of farm ponds and retention ponds in urban areas evidence the need for educational programming to respond to the questions and problems associated with pond management including weed control, sedimentation, and fish stocking.

What has been done

Natural resource management educators have conducted programs for these targeted audiences during the past several years and focused a statewide audio conference on pond management for the first time this year. Local Extension offices hosted the participants and local staff provided the visuals aids, handouts, led discussions, and distributed and collected evaluation forms. Of the 151 participants, 134 completed and turned in the evaluation.

Results

Pond owners indicated that they planned to implement the following ideas learned through this program:

-Managing aquatic weeds - 36 [26%]
-Controlling erosion into the pond - 19 [14%]
-Fish management recommendations - 32 [24%]

Those considering building a pond indicated that they planned to implement the following ideas learned through this program:

-Use recommendations to establish proper location and pond base - 41 [31%]
-Use fish stocking recommendations 10 [7%]
-Establish the correct size of watershed 4 [3%]

4. Associated Knowledge Areas

KA Code	Knowledge Area
133	Pollution Prevention and Mitigation
112	Watershed Protection and Management

Outcome #14

1. Outcome Measures

Proper Disposal Of Hazardous Waste By Communities

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:
Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	35

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Waterways are being contaminated with prescription drugs flushed down drains and mercury and other contaminants from the disposal of electronic wastes.

What has been done

Illinois-Indiana Sea Grant developed a resource kit and held workshops to help communities start unwanted medicine take-back programs. The website ecyclingtools.com was also developed to help communities and businesses develop collection programs for electronic wastes and helped them plan collection events in 10 communities around the Great Lakes. A related effort led by Master Gardeners in the metropolitan county of McLean involved collecting and recycling plastic garden pots and trays.

Results

As a result of these educational resources and with the support of U.S. EPA funding, 25 take-back medicine events collected four million pills and 10 community electronic waste collection events recycled 10 million pounds of e-waste on Earth Day 2008. Over 11,000 pounds of garden plant trays and between three and four thousand pounds of plastic garden plots have been recycled in one metropolitan county with an additional 5,500 pots and trays given to groups/individuals or returned to nurseries for reuse.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
133	Pollution Prevention and Mitigation

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Economy
- Appropriations changes
- Public Policy changes
- Government Regulations
- Competing Public priorities

Brief Explanation

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

1. Evaluation Studies Planned

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

Evaluation Results

C-FAR Water Quality SRI

Both run-off and drainage from agricultural fields and discharges from factories and sewage treatment plants directly affect quality of water supplies for both rural and urban residents.

In 2000, the United States Environmental Protection Agency [USEPA] published nutrient criteria recommendations for rivers and streams, but allowed for individual states to adopt other scientifically defensible criteria or adjust them to better reflect state-specific conditions.

In response, the Illinois Council on Food and Agriculture Research [C-FAR)] established a strategic research initiative [SRI] in water quality with the goals being to help develop the scientific basis for nutrient standards in the surface waters of Illinois and to assist in the appropriate development and implementation of Total Maximum Daily Loads (TMDLs). A number of research studies were funded and carried out during the past three years and results have been communicated through conference proceedings, graduate theses, journal articles, Extension meetings, water quality related events, and public forums. The final forum and most comprehensive summary of the Water Quality SRI was presented to the public on October 23, 2007. Each research team presented key findings and summarized their work. Research teams provided updates to an audience of about 125 people representing C-FAR, the state legislature, and agribusiness. Audience evaluations after the water quality forum were very favorable. When asked to evaluate the program, the average response was 8.2 (1 = lowest, 10 = highest). Responses to the open-ended questions on the evaluation clearly indicated that the C-FAR strategic research initiative has provided valuable insight related to the development of nutrient standards. Comments from over one-third of the participants indicated that due to the shared research findings their knowledge increased regarding factors that may have greater impacts on biotic integrity than nutrient concentration alone and that these factors, such as physical habitat, sediment, light availability, temperature, and hydrology, are part of a complex relationship affecting biotic responses in rivers and streams. They also recognized that the research raised additional questions and that the challenge to adopt practical and effective nutrient standards to ensure Illinois' water quality remains.

Key Items of Evaluation

Program #12

V(A). Planned Program (Summary)

1. Name of the Planned Program

Plant Heath, 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	5%		15%	
202	Plant Genetic Resources	5%		10%	
205	Plant Management Systems	25%		10%	
206	Basic Plant Biology	10%		10%	
211	Insects, Mites, and Other Arthropods Affecting Plants	8%		5%	
212	Pathogens and Nematodes Affecting Plants	6%		10%	
213	Weeds Affecting Plants	6%		10%	
214	Vertebrates, Mollusks, and Other Pests Affecting Plants	5%		10%	
216	Integrated Pest Management Systems	30%		20%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2008	Extension		Research	
	1862	1890	1862	1890
Plan	27.0	0.0	19.0	0.0
Actual	42.2	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
2056172	0	2052624	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
1697209	0	2052624	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
14233088	0	11218123	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Activities under the sub goal "Maximizing the benefits from specialty crop production systems" include development of a sudangrass cover crop system that provides an important new tool for farmers to suppress Canada thistle; development of elite sweet corn germplasm with enhanced levels of phytochemicals that promote health among the consuming public; demonstrations that high-end salad green vegetables like Arugula, Mizona, picana, and Claytonia can be produced during the winter months in central Illinois under high tunnels for the fresh-cut market; greenhouse experiments to optimize mustard biofumigants; and research designed to identify the critical factors for suppressing pests of cucurbits with mustard or buckwheat.

Activities under the sub goal "Increasing the number of PhD graduates in plant breeding and expanding research in plant breeding" included the development of experimental lines that were evaluated for yield as well as for disease and pest resistance. One of the lines is being licensed to seed companies and seed from it was increased during 2008 and the other line was released as a parent for other breeders to use. Both lines have been widely used as a parent by both private and public sector soybean breeders.

Activities under the sub goal "Conducting cutting edge research that will increase crop production with minimal energy input and minimal negative impact on the environment and translate the results to producers and their advisors" included development of a method to rapidly assay for resistance to a particular group of herbicides [those that inhibit the enzyme protoporphyrinogen oxidase, more generally known as PPO-inhibiting herbicides] in the weed waterhemp [Amaranthus tuberculatus]; insecticide evaluations that provided Midwest growers with specific information on the effectiveness of newly labeled insecticides against key pests of apples and peaches; and apple physical map studies that have allowed us to partner with scientists in New Zealand to pursue the development of new single nucleotide polymorphisms [SNPs] in apple from BAC-end sequences.

Activities under the sub goal "To identify techniques that will obviate crop production factors that result in degradation of the environment" include studies that indicate that an increase of synthesis of the soybean plant chemical weapons such as the anti-microbial compound glyceollin and cell wall fortifying compound lignin could help to improve soybean rust resistance [thus, one way to achieve potentially higher levels of soybean resistance to rust could be genetic manipulation of metabolic events that could lead to production of glyceollin and/or lignin], work to generate quantitative, comparative in vitro mammalian cell toxicity data of emerging disinfection by-products and related compounds [the first systematic cytotoxicity and genotoxicity analysis of its kind], development of new methods to screen for resistance to soybean pathogens, including quantitative PCR [QPCR] methods and a method to screen for resistance to charcoal rot in controlled environments, and continued research into the management of Phytophthora Blight in support of the pumpkin industry, currently the most valuable vegetable industry in Illinois.

Conferences and presentations made by Investigators under this Planned Program in 2008 included the Horseradish Grower’s School, Midwest Organic Production and Specialty Marketing Conference, Illinois Specialty Growers Conference, University of Illinois Agronomy Day, International Sweet Corn Development Association, American Chemical Society, North Central Weed Science Society, the Plant and Animal Genome Conference, the Maize Genetics Conference, North Central Weed Science Society, Weed Science Society of America, American Society of Plant Biologists, University of Illinois Corn and Soybean Classic, National Fusarium Head Blight Forum, Illinois Crop Protection Technology Conference, and the American Phytopathological Society.

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 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 3,355 active Master Gardeners in Illinois. This past year, 600 new Master Gardeners completed training at various locations in the state and through an online course. Other horticulture plant health Extension programs are targeted at commercial growers of vegetables, tree fruits, small fruits, grapes, turf grass, and grounds maintenance through regional or statewide workshops.

The plant clinic and Digital Diagnostic System 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 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. Pesticide safety education was conducted using Power Point presentations at numerous locations for 7,936 commercial and 2,100 private pesticide applicators. 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 four locations [including one in Colorado] to ensure 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 41 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. Extension of research to the public also includes the Varietal Information Program for Soybeans, a website [123,000 visits annually] and publication [5,000 distributed] that provides information on the yield, protein and oil, and disease and pest susceptibility.

Two-day Regional Crop Management Conferences were held in four locations in 2008. Topics included current biofuel and tile drainage research, environmental implications of corn ethanol production, and water quality and gulf hypoxia update along with 18 breakout sessions that addressed soil fertility and management and pest management issues from both economic and environmental perspectives. The primary audience of 370 was certified crop advisers [92%].

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

2. Brief description of the target audience

Farmers growing cucurbit vegetables, processed pickle and pumpkin industries, Extension agents, crops consultants, the soybean breeding research community, soybean growers, weed management professionals, scientists in the Rosaceae community, commodity associations, farm bureaus, crop producers and processors, water scientists and regulators, environmental protection agencies, vegetable growers, agribusiness personnel, home owners, and Extension Master Gardeners.

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	52750	2549000	4000	228000
2008	168981	174719	60601	0

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

Patent Applications Submitted

Year	Target
Plan:	0
2008 :	2

Patents listed

Two patents were submitted in 2008, numbers 12/040,857 and 61/028,459.

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

	Extension	Research	Total
Plan	0	92	
2008	4	102	102

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of completed research projects

Year	Target	Actual
2008	27	6

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	Educating Weed Management Clientele On The Management Of Waterhemp
4	Providing Management Information To Farmers With Regard To Managing Soybean Cyst Nematode Heteroda, Glycines
5	Educating Grower-Cooperators On The Use Of Bt-Hybrids to Manage Western Corn Rootworm While Minimizing Chemical Exposure And Simplifying Planting Operations
6	Percent Of Nitrogen Utilization By Wheat
7	Using Genetic Resistance To Control Aflatoxin And Fumonisin In Corn Grain
8	More Informed Users Of Pesticides
9	Increased Knowledge Of New Crop Management Techniques

Outcome #1

1. **Outcome Measures**

Number of participants demonstrating changes in KASA

Not reporting on this Outcome for this Annual Report

Outcome #2

1. **Outcome Measures**

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

Not reporting on this Outcome for this Annual Report

Outcome #3

1. **Outcome Measures**

Educating Weed Management Clientele On The Management Of Waterhemp

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Waterhemp is one of the most challenging weeds facing Midwest crop producers. Numerous waterhemp populations have evolved resistance to various herbicides, including PPO-inhibiting herbicides and glyphosate. Previously, we identified the molecular basis of resistance to PPO-inhibiting herbicides in waterhemp. We have continued to extend this research to additional waterhemp populations to learn how common this mechanism is. By determining that this mechanism seems to be the primary [if not the only] mechanism of resistance to PPO-inhibiting herbicides in waterhemp, we have gained increasing confidence in the reliability of the rapid, DNA-based assay for this resistance.

What has been done

A method was developed to rapidly assay for resistance to a particular group of herbicides [those that inhibit the enzyme protoporphyrinogen oxidase; more generally known as PPO-inhibiting herbicides] in the weed waterhemp [Amaranthus tuberculatus]. This assay was utilized on numerous waterhemp plants suspected to contain this herbicide resistance, and provided to us by crop producers and weed management professionals. Results of the assay were then utilized by these individuals to make weed management decisions. Timely information on management of waterhemp with resistance to PPO-inhibiting herbicides, as well as waterhemp with resistance to glyphosate [which currently is the most important herbicide used in Illinois and elsewhere] was disseminated to weed management clientele via various Extension meetings and Extension newsletter articles.

Results

Resultant information is being used to inform weed management clientele how to best manage this resistance and mitigate its occurrence in their own fields. Because most Midwest producers rely heavily on glyphosate for weed control, particularly in soybean production, this research is having a significant impact throughout the region. Furthermore, since the PPO-inhibiting herbicides currently are the best alternative to control waterhemp if glyphosate fails to give satisfactory control, and with the expected increase in occurrence of glyphosate-resistant waterhemp, our rapid assay for resistance to the PPO-inhibiting herbicides will be of increasing importance.

4. Associated Knowledge Areas

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

Outcome #4

1. Outcome Measures

Providing Management Information To Farmers With Regard To Managing Soybean Cyst Nematode Heteroda, Glycines

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	2000

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

The soybean cyst nematode Heterodera glycines is responsible for major economic losses to soybean producers. In Illinois, over 80% of its four million hectares of soybean are infested with yield-reducing population densities of the nematode. The primary means of managing H. glycines is through the use of resistant soybean cultivars; unfortunately, over 90% of the resistant cultivars are derived from the same source, known as plant introduction [PI] 88788.

What has been done

The nematode has responded to the wide deployment of this source of resistance by adapting to it. Rotation with cultivars derived from alternative sources of resistance [PI 548402 and PI 437654] is recommended for fields in which the H. glycines population has adapted to PI 88788. Field survey results suggested that these sources of resistance are not mutually exclusive; H. glycines populations adapted to one source of resistance do not revert [lose their adaptation] when challenged with a second source. Analysis of virulence profiles from 1,053 H. glycines field populations confirmed a highly significant positive correlation between virulence on PI 88788 and 548402, but no relationship between virulence on PI 88788 and 437654. Virulence is measured as a female index: development of females on a soybean line relative to development of the same isolate on a standard susceptible soybean line under the same conditions. However, analysis of virulence profiles from 229 tests on inbred lines of H. glycines showed the converse: a significant positive relationship between virulence on PI 88788 and PI 437654, but no relationship between virulence on PI 88788 and PI 548402. These relationships must be clarified in light of current management recommendations.

Results

This research has resulted in two main outcomes. First, the management recommendations for soybean cyst nematode in Illinois have changed to emphasize monitoring population densities, as opposed to scouting for presence or absence. More than 2,000 individuals in agribusinesses including farming, consulting, and supplying production materials were provided with this information during 2008. Surveys showed that awareness of the change in emphasis has increased to over 60%. Second, analysis of the field population data showed that use of the full HG Type test is not necessary for making cultivar recommendations to farmers. This reduced the cost of the test by 50% and increased the number of soil sample submissions for testing twofold.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
216	Integrated Pest Management Systems

Outcome #5

1. Outcome Measures

Educating Grower-Cooperators On The Use Of Bt-Hybrids to Manage Western Corn Rootworm While Minimizing Chemical Exposure And Simplifying Planting Operations

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Western corn rootworm [WCR] is a pest of U.S. corn. Bt-corn hybrids offer WCR control equivalent to insecticide with simplified planting operations and reduced chemical exposure. Use of Bt-hybrids requires establishment of non-Bt corn refuges [equal to 20% of Bt-planted area] to preserve susceptible genotypes necessary to delay development of Bt resistance. Improved stewardship of Bt-hybrids and grower profitability could occur if IPM were used with Bt hybrids. We hypothesize that WCR egg-laying could be concentrated onto manageable portions of soybean fields by exploiting WCR tendencies to lay eggs in late-planted corn. If egg-laying were concentrated, growers could use Bt-hybrids only on those locations, and apply a non-Bt-based technology [e.g., insecticidal seed treatment] to less-threatened areas. Focused use of Bt on small areas of a field [10-20%] would reduce seed costs and local selection for resistance to Bt. Our goal is to test the feasibility of a late-planted corn trap crop [an egg-laying sink] to manage WCR injury in rotated cornfields.

What has been done

In 2008, we evaluated the root injury across the areas formerly occupied by the trap crop and adjacent soybean to see if the use of late corn had concentrated the potential for injury.

Results

Early in 2008, we met with grower-cooperators to review the 2007 season findings and discuss the results of insect monitoring in their fields and on University of Illinois plots. Attention was paid to the likelihood of economic injury in grower fields based on abundance monitoring using Pherocon AM Yellow Sticky Traps. Our results indicated significant injury was likely in most fields. During this meeting we also discussed and advised our producer cooperators on the placement of untreated check rows of corn on the ground occupied by late-planted trap corn and soybean during the 2007 season. To minimize the impact of yield loss from untreated corn, we asked growers to plant 7-9 [depending on the prior trap crop treatment] single rows of untreated check corn. We increased the value of our activities by asking them to locate rows of WCR-resistant transgenic and non-transgenic refuge corn next to check rows. Placing these corn types in areas of documented WCR abundance and activity allowed efficacy comparisons among different management options under identical conditions.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems
211	Insects, Mites, and Other Arthropods Affecting Plants
201	Plant Genome, Genetics, and Genetic Mechanisms
205	Plant Management Systems

Outcome #6

1. Outcome Measures

Percent 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
2008	{No Data Entered}	40

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.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
206	Basic Plant Biology

Outcome #7

1. Outcome Measures

Using Genetic Resistance To Control Aflatoxin And Fumonisin In Corn Grain

2. Associated Institution Types

•1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

This project will create inbred lines that are agronomically acceptable with high levels of resistance to Aspergillus ear rot and aflatoxin production or Fusarium ear rot and fumonisin production thereby resulting in low or no levels of either of these two mycotoxin producing organisms in food for human consumption or corn-based animal feeds.

What has been done

This project is creating high yielding, commercially acceptable corn hybrids with high levels of resistance to Aspergillus ear rot and low levels of aflatoxin in grain. This is being accomplished by moving chromosome regions associated with resistance from resistant inbreds Tex6 and Mp313E into the commercially elite, but susceptible, inbred lines FR1064, LH195RR, LH310, and LH311 using molecular marker assisted backcrossing. All of these susceptible lines are genetically related to many lines that are used as female parents of commercial hybrids in the United States.

Results

Aflatoxin is a serious problem in the central United States and often an annual problem in southern states. Unfortunately, most commercial seed corn companies have not done the extensive research necessary to create inbreds and hybrids that have low levels of aflatoxin in grain. Therefore, the basic research and development must first be done in the public sector. This research is demonstrating the usefulness of marker assisted selection to incorporate resistance into commercially usable inbred lines. We are paving the way for commercial companies to incorporate resistance into their lines and hybrids without having to be concerned with yield drag and without the laborious task of evaluating for toxin after each cycle of breeding for resistance.

4. Associated Knowledge Areas

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

Outcome #8

1. Outcome Measures

More Informed Users Of Pesticides

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	10625

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Use/application of pesticides has potential adverse impacts on the environment, crops grown, and the pesticide applicator.

What has been done

Master Gardener multi-county training sessions and online training was completed by 600 new volunteers. Pesticide training sessions focus on pesticide characteristics, correct application procedures, problems that may occur with the use of pesticides, where information can be obtained, and steps to take if a problem occurs with the use of a pesticide. To determine knowledge gained and teaching effectiveness of the instructors, participants at 10 Private Pesticide Applicator Training programs in northwestern Illinois were given a pre-test and post-test of the same questions representing topics in each of the six training modules. Participants responded using the TurningPoint technology response card with two questions per module. The pre-test consisted of questions from all modules given prior to the training. Post-test questions were given when the instructor finished teaching each module. [Note: There were 2,100 private pesticide applicators trained and tested in 2007-2008.]

Results

Based on a retrospective evaluation conducted via an online survey in 2007 by the state Coordinator of Master Gardeners to assess 12 gardening practices, 11 personal improvement skills, and Master Gardeners' experience in teaching horticulture topics, results would suggest that an additional 162 [27%] used pesticides only according to the directions after the training [65% before the training as compared to 92% after].

Approximately 80 percent [634] of the 792 individuals that attended the Private Pesticide Safety Education Programs chose to respond to the pre-test post-test questions. The percent of respondents correctly answering the 12 questions increased for post-test scores compared to the pre-test for all 12 questions, with over 90% of the respondents answering 5 of the 12 post-test questions correctly. The greatest increases in correct answers were noted for the integrated pest management module questions--weed classification life cycle [an additional 25.7% of the respondents knew the correct answer after the training] and the cause for the greatest number of crop diseases [an additional 22.7% knew the correct answer]. Other large increases in the number of participants' correct post-test answers included recognition of the contents of a pesticide label [24.9% increase in participants], required personal protective equipment [24.9% increase], and how to increase application equipment nozzle flow [36.8% increase].

4. Associated Knowledge Areas

KA Code	Knowledge Area
213	Weeds Affecting Plants
206	Basic Plant Biology
216	Integrated Pest Management Systems
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants

Outcome #9

1. Outcome Measures

Increased Knowledge Of New Crop Management Techniques

2. Associated Institution Types

•1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2008	{No Data Entered}	247

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Crop producers are continually impacted and must manage and reduce risks related to current economic forces, weather, and pests/diseases that damage and affect crop production, yield, and marketing. For example, the adoption of transgenic corn and soybean varieties has decreased the diversity of weed and insect management strategies and increased selection pressure for resistance development.

What has been done

In July and August, Agronomy Field Days were held at the University of Illinois Crop Science Research and Education Centers in DeKalb, Monmouth, Perry, Brownstown, Dixon Springs, and Champaign-Urbana. Extension Specialists and other researchers provide practical advice based upon current research to tour groups of farmers, landowners, and agricultural industry professionals that circulate through the research plots. Resistance Management for both weeds and insects was a major topic at the Summer 2008 tours. Survey cards were passed out at one tour stop at the Champaign-Urbana Agronomy Day and collected prior to the participants return to the central tent. 144 survey cards were collected.

Regional Crop Management Conferences were held statewide in four locations. These 2-day workshops included 20 unique presentations on topics of concern to 370 producers and Certified Crop Advisers. Four general sessions focused on agricultural environmental issues. An electronic audience response system was used at one location to actively gather on-site information about knowledge gained at the conference.

Results

On a scale of 1 to 5 [not useful to very useful] the participants in the Agronomy Field Day rated information received at the field day as an average of 4.2. Responses indicated participants managed a total of 776,130 acres of farm ground. The following results regarding resistance management indicated that they were already implementing the following practices: 1) 88% reported use of transgenic crops; 2) 86% reported planting the required insect management refuge; and 3) 73% reported scouting their transgenic crops to monitor pest activity and performance. Since 82% of the total 900 attendees had attended Agronomy Day before, the three practices above could have been precipitated by their previous Agronomy Day research plot tour presentations.

With respect to increased knowledge of new crop management techniques, 67% of the participants in Crop Management Conferencees indicated they would use information on management strategies for increasing soybean yields, 33% indicated they would use information presented on weed management techniques, 25% would use information on crop budgets and leasing, and 16% would use information provided about the 2008 Farm Bill impacts on crop production decision-making.

With respect to becoming a more informed pesticide user, 70% indicated they would use information on IPM economic threshold, 41% would use information on Japanese beetle management, 36% would use insect trapping and invasive species monitoring, 19% would use information on nematode management in corn and soybeans, and 17 % would use information on crop phonology and heat units insect management.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
202	Plant Genetic Resources
213	Weeds Affecting Plants
216	Integrated Pest Management Systems
205	Plant Management Systems
201	Plant Genome, Genetics, and Genetic Mechanisms

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought,weather extremes,etc.)
- Economy
- Appropriations changes

Brief Explanation

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

1. Evaluation Studies Planned

- Before-After (before and after program)
- During (during program)
- Other (post then pre retrospective stud)

Evaluation Results

Key Items of Evaluation