V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Global Food Security and Hunger

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
111	Conservation and Efficient Use of Water	0%		10%	
123	Management and Sustainability of Forest Resources	0%		10%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		25%	
204	Plant Product Quality and Utility (Preharvest)	25%		0%	
216	Integrated Pest Management Systems	25%		0%	
604	Marketing and Distribution Practices	10%		10%	
701	Nutrient Composition of Food	5%		20%	
703	Nutrition Education and Behavior	30%		10%	
704	Nutrition and Hunger in the Population	5%		15%	
	Total	100%		100%	

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Actual	29.0	0.0	8.3	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**
955483	0	526643	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
955483	0	526643	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
8872832	0	5356295	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Research activities in 2010 included projects that focused on creating marketable products from corn and soybean ranging from increasing oil content in soybean to influencing the agricultural biotechnology regulatory process in countries that are deemed potential importers of corn and soybeans with biotechnology traits, work with soy dairy and soy applications in baking in Vietnam and Honduras that has continued to grow as microenterprises employ local women in the production and creation of over 40 different soy dairy and soy enhanced baked products for the marketplace as well as donation to the local school feeding programs, the development of a rapid and sensitive inverse gas chromatographic [IGC] method for the quantitative measurement of interactions between volatile flavor compounds and solid food matrices, studies which show that Refractance Window technology has potential as an alternative to spray drying for production of flavor powders [the flavor industry is always on the lookout for new/emerging technologies for improved flavor encapsulation], efforts to reduce charcoal rot of soybean [charcoal rot of soybean has become one of the most important soybean yield-limiting factors in recent years], work to develop microfluidic devices and biosensors which are valuable biodegradable alternatives, and efforts to improve our understanding of the evolution of molecular systems for improved genetic engineering of crop plants.

Additional research activities included the further development and evaluation of maize germplasm for use in functional genomics approaches to gene discovery for nitrogen [N] use efficiency, work to determine the potential of improving maize for food processing quality and yield [in cooperation with industry partners such as Kellogg's and Bunge North America], work at the National Soybean Research Laboratory with a local, Kenyan NGO that has resulted in the development of a school lunch program using soy protein in the meals for schools in the Masai Mara along with outreach to the students, teachers, parents and community leadership on the importance of nutrition, research demonstrating the usefulness of marker assisted selection to incorporate resistance into commercially usable inbred lines [aflatoxin is even a more serious problem in most of Africa where people are forced to eat poor quality corn], and the discovery that disease resistant apple cultivars have marketing and nutritional qualities comperable to commercially popular cultivars.

Conference presentations in 2010 included the National Meeting of the Entomological Society of America, the Annual Meeting of the Institute of Food Technologists, the American Chemical Society Symposium, the 12th International Workshop on Fire Blight, the 52nd Annual Maize Genomics Conference, the Annual Meeting of the Society of Nematologists, the National Corn Growers Association Corn Utilization and Technology Conference, the American Society of Agronomy, the Society of Toxicology, the American Association of Veterinary Laboratory Diagnosticians, and the Society of

Toxicologic Pathology.

State and regional Extension conferences/clinics and field days reach large numbers of corn and soybean producers with information on fertility and pest management. **Corn and Soybean Classics** meetings [six regional-based meetings] that address the latest research concerning weed management, fertility, stewardship, and pest management reached 998 producers and agricultural consultants. The multi-state **AGMasters Conference** held on campus and two-day **Regional Crop Management Conferences** were held in four locations in 2010. The primary audience was certified crop advisers. Extension of research to the public also includes the **Varietal Information Program for Soybeans**, a website and publication that provided information on yield, protein and oil, and disease and pest susceptibility. The electronic **Pest Management and Crop Development Bulletin** series was prepared biweekly during the growing season by entomologists, agronomists, and plant pathologists to report on the current agricultural conditions with advice on pest management. The Plant Clinic diagnosed 2,346 plant samples in 2010 that included 489 soybean rust sentinel plot samples.

Statewide Extension Conferences related to produce production included several multi-state conferences: **Iowa/Illinois Fruit & Vegetable Growers Symposium, Iliana Vegetable Growers School, and the Illinois/Wisconsin Fruit & Vegetable Conference.** Additional Illinois state or regional conferences focused specifically on growing horseradish, vegetables, tree fruit, or small fruit and strawberries. Extension also provided leadership for the **Specialty, Agritourism and Organic Conference** and distributed 24 issues of **Fruit and Vegetable News.**

Pesticide safety education was conducted using presentations at numerous locations with teaching contacts numbering 8,768 through commercial training and 5,161 through private pesticide training. **Operation S.A.F.E. Fly-in** was conducted in seven locations 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 68 aircraft and adjustments were made to the aircraft setup if needed. The plant clinic and Digital Diagnostic System provided extensive outreach through 3,972 contacts seeking diagnosis and solutions for samples of invasive and exotic species pests. Information is also disseminated electronically via a quarterly multi-state newsletter focused on integrated pest management successes and activities.

Extension activities that addressed hunger within Illinois are delivered by **Expanded Food and Nutrition Education Program [EFNEP]** staff and **Supplemental Nutrition Assistance Program Education [SNAP-Ed]** staff members who conduct hands-on activities with children and their parents with limited incomes. These activities include using food stamps, meal planning, wise shopping, and use of food pantries.

The Southern Region Extension staff members implemented a regional initiative **Healthy and Safe Food** partnering with volunteers and local agencies to plan and create **GIFT [Growing Illinois Food Together] Gardens**. Many of the gardens were the creation of youth who were mentored by adults. Over 5,400 pounds of produce were harvested from 16 participating counties and shared with food pantries, sold at Farmers' Markets, and enjoyed by participants' families.

Other Extension initiatives receiving attention focused on an interactive web-based multi-state market system [**MarketMaker**], small tract farming **[Living on the Land]**, and local food systems through workshops, conferences, and demonstrations. Other programs related to food production and consumption are encompassed in the Animal Health & Production planned program.

2. Brief description of the target audience

Members of the target audience included U.S. consumers of food and fuel, consumers in developing countries that may become new purchasers of U.S. produced GM corn and soybean, U.S. seed companies and international regulators of agricultural biotechnology crop imports, lower income communities in Latin America, Southeast Asia, and Africa, members of the soybean breeding research community, the U.S. Environmental Protection Agency, corn seed companies, corn farmers, and populations in underdeveloped countries. Extension targeted producers of feedstuffs for livestock, producers of fruit and vegetable crops, limited resource audiences that are food stamp eligible, and youth.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Plan	{NO DATA	{NO DATA	{NO DATA	{NO DATA
Actual	116471	35935	31819	0

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

Patent Applications Submitted

Year: 2010

Plan:

Actual: 1

Patents listed

Methods For Producing Fertile Crosses Between Wild And Domestic Soybean Species

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	2	54	56

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number Of Completed Hatch Projects

Year	Target	Actual
2010	{No Data Entered}	3

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Improving Soy Products For Better Consumer Acceptance
2	Improved Treatment Of Charcoal Rot In Soybean
3	Developing Soybean Varieties With Improved Resistance To Soybean Cyst Nematode
4	Improving Maize For Better Food Processing Qualities
5	Utilizing Soy Products To Improve Nutrition In Developing Countries
6	Better Food Security Through Improved Nitrogen Utilization Of Corn
7	Developing A Sustainable Method Of Soybean Cyst Nematode Control
8	Increased Knowledge Of Small Acreage Land Management Practices
9	Expansion/Adoption/Development Of Outreach Programs For Small Farmers And Ranchers
10	Increased Access Among Food-Related Enterprises

Outcome #1

1. Outcome Measures

Improving Soy Products For Better Consumer Acceptance

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The long-term goal of this study is to develop successful soy foods targeted for mainstream food products in the U.S and globally, to provide better nutritional options for the consumers, and to eventually change consumer perception of soy foods. The project objective is to determine the drivers of liking and disliking among different matrices of dairy-analogue soy foods to investigate the food matrix effect on soy flavor.

What has been done
In order to successfully develop and market soy-derived foods, we need to identify the drivers of consumer liking and disliking of soy foods across various food matrices. Although many researchers have studied potential ways to deliver soy in novel forms, little is known about specific sensory attributes associated with soy snacks, or how those attributes drive liking for consumers. Results indicate that consumers generally accept samples characterized by attributes such as crunchy, cumin, curry, salty and umami, but dislike samples with wheat, rough or porous attributes.

Results
Indian consumers differed from the U.S. consumers in that their preferences were more varied, and they tended to be more tolerant of wheat and porous attributes. Therefore, different strategies should be utilized when developing products for these groups to cater to their specific inclinations. The knowledge gained from this study will allow us to better understand the flavor function of soy in different food systems and how to best present soy to the consumers globally. The outcome of this study will have a significant impact on promoting the sales of soy foods by providing means to reduce the undesirable taste/flavor characteristics.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices
701	Nutrient Composition of Food
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

Outcome #2

1. Outcome Measures

Improved Treatment Of Charcoal Rot In Soybean

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Charcoal rot of soybean has become one of the most important soybean yield-limiting factors in recent years. Because the pathogen is a generalist and a facultative necrotroph, complete resistance is unlikely to be found in the soybean gene pool or in any soybean allies. However, partially resistant soybean genotypes have been identified that can limit the impact of the disease on soybean yield. Field screening of soybean for charcoal rot resistance has had variable and inconsistent results, mainly due to strong genotype x environment interaction and lack of standardization of testing methods. Development of non-field screening methods with standard and quantified inoculation can help control the g x e interaction and produce more accurate and consistent measurements of Mp colonization in soybean genotypes.

What has been done
We have developed and have begun putting into practice two methods, a pipette tip inoculation method and a qPCR method, to evaluate Mp colonization. Similarly, we developed a qPCR method to evaluate Pp colonization to enable more accurate measurements of incomplete and partial resistance to soybean rust. Soybean breeders seeking to identify and incorporate more durable rust resistance than the seven known complete rust resistance genes, which have proven ineffective after relatively short duration in soybean production, will increasingly apply the qPCR screening method in their rust resistance breeding programs. If the cloned putative resistance gene is confirmed as Rag2, this gene will be applied to further studies on the molecular basis of

soybean aphid resistance and may be directly transferred through transformation to new soybean genotypes. Rag2 is already being stacked with Rag1 and other resistance genes through backcrossing and marker-assisted selection techniques to increase the spectrum of resistance against aphid biotypes.

Results
Cloning of Rag2 with transformation will significantly facilitate resistance gene stacking. Our identification of soybean aphid biotype 3, which readily colonized plants with the Rag2 and other known aphid resistance genes, indicated that high variability in virulence towards soybean resistance genes is already present in soybean aphid populations, even before resistance genes are deployed into soybean production. This finding will encourage research into improving integrated management of the pest with other control methods such as application of insecticides and biological controls, and to developing methods to monitor soybean aphid virulence to enable intelligent deployment of resistance genes. Currently, there is a lack of effective control practices to manage SDS other than deployment of partial resistance. Soybean breeders will stack the new putative QTL for resistance to SDS, identified in PI 507531, from analysis Golden Gate Assay results of genomic DNA, with other SDS resistance genes to improve SDS resistance.

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems

Outcome #3

1. Outcome Measures

Developing Soybean Varieties With Improved Resistance To Soybean Cyst Nematode

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Soybean cyst nematode remains one of the most important soybean diseases in Illinois and across the United States

What has been done
During 2010, the soybean breeding program developed new experimental lines and tested lines for yield, agronomic traits and disease and pest resistance. The most advanced lines were evaluated in regional tests that resulted in the evaluation of the lines across several locations in many states. Those lines with the greatest yield and resistance were selected in these tests and five new varieties were released from the program.

Results
The released varieties are LD06-16721, LD06-30504Ra, LD06-30505Ra, LD04-11056H, and LD04-13265. All five varieties have resistance to soybean cyst nematode. LD06-16721 is a conventional maturity group II variety that combines high yield with the aphid resistance gene Rag1. LD06-30504Ra and LD06-30505Ra are both MG II varieties that have the Roundup Ready herbicide resistance gene combined with high yield and the soybean aphid resistance gene Rag1. LD04-11056H and LD04-13265 are MG III varieties that were released because they combine high yield with SCN resistance. These varieties were licensed to a commercial company which will market them to soybean producers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems
604	Marketing and Distribution Practices

Outcome #4

1. Outcome Measures

Improving Maize For Better Food Processing Qualities

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
We have conducted field trials in the summers of 2009 and 2010 under high and low nitrogen to determine the potential of improving maize for food processing quality and yield.

What has been done
Data on 66 hybrids derived from all combinations of 12 inbreds representing key heterotic subgroups relevant to U.S. commercial corn germplasm have been collected on a myriad of agronomic characteristics including yield, yield components [e.g. kernel size, weight, and number per ear], grain moisture at harvest, standability, flowering, barrenness, and seedling vigor, to name a few. Furthermore, a protocol for dry milling of small grain samples has been developed to facilitate evaluation of yields of large grits. With input from key stakeholders [Kellogg's and Bunge North America] we have identified a number of important factors contributing to milling yields and quality and data are being collected on these characteristics as well.

Results
The development of a dry milling protocol based upon a 1-kilogram sample of grain is important because it opens the door for selection based on dry milling yields in plant breeding and cultivar improvement. Without the ability to generate data from small plot field samples on a fairly sizeable population of various lines, milling quality and yields cannot be considered in selecting among various genotypes, nor can data related to agronomics be factored into the overall assessment of yield of large grits on a per acre basis. This work provides a first insight into the inheritance of processing traits in corn and the extent to which these traits are influenced by the environment and cultural practices. The germplasm also contributes to the impact of the analysis. Using the Elite Maize Association Mapping Panel, results will apply to a broad base of U.S. commercial corn germplasm. Methods for indirect selection for dry milling yields are anticipated as well, which will minimize the need for laborious efforts to collect massive amounts of dry milling yield data in the future. Kellogg's is acutely interested in the results of this project as a producer of a number of food stuffs from large corn grits [eg. corn flakes]. Bunge North America, as a corn dry miller, has interest in the findings to improve efficiency in the dry milling process. Whereas currently, corn grits are processed from commodity corn, this work may indicate potential prospects for an identity-preserved value chain for seed products created for enhanced dry milling yield and quality.

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
604	Marketing and Distribution Practices
701	Nutrient Composition of Food
704	Nutrition and Hunger in the Population

Outcome #5

1. Outcome Measures

Utilizing Soy Products To Improve Nutrition In Developing Countries

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The protein gap around the world is a growing challenge for developing nations and the National Soybean Research Laboratory works to develop soy-based solutions to this challenge through partnership with local governments, universities, and local and international Non-Governmental Organizations utilizing knowledge transfer, training, and product development.

What has been done
The work in Haiti, Kenya, India and Guatemala has focused on a broad range of soy protein applications such as soy enhanced porridge. The use of soy granules in local dishes for school lunches took place in the Caribbean, Africa, Asia, and Central America.

Results
The NSRL work with a local, Kenyan NGO has resulted in the development of a school lunch program using soy protein in the meals for schools in the Masai Mara along with outreach to the students, teachers, parents and community leadership on the importance of nutrition. The community has adopted the program and leveraged their community funds with other outside funds to continue the lunch program. The work with school feeding also extends to efforts in Haiti to pair a healthy school meal with a strong nutrition education program for students, their parents and teachers, as well as a similar effort with school meals in Guatemala and a unique opportunity to begin introducing soy protein extruded snacks for use by a large local NGO providing over a million school meals a day for children in India.

4. Associated Knowledge Areas

KA Code	Knowledge Area

604	Marketing and Distribution Practices
701	Nutrient Composition of Food
703	Nutrition Education and Behavior
704	Nutrition and Hunger in the Population

Outcome #6

1. Outcome Measures

Better Food Security Through Improved Nitrogen Utilization Of Corn

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Continued demand for corn grain to feed and fuel a growing world population will require further gains in genetic improvement for yield and agronomic input efficiency traits. Improvement of corn N use efficiency [NUE], in particular, will benefit from a thorough understanding of how past genetic improvement has shaped current N use parameters.

What has been done
We characterized 21 hybrids released in different years ranging from 1967 - 2006 for grain yield and N use traits. These hybrids were grown under three different levels of N availability in an N responsive evaluation nursery. Several traits were evaluated including plant biomass and N content, grain yield, yield components, NUE and its components, and measures of grain quality. Our hypothesis was that continued selection for grain yield under high levels of N fertilizer has resulted in modern hybrids with a larger response to fertilizer N than hybrids from earlier eras. Contrary to our hypothesis, the results of this study show that the response of grain yield to fertilizer N has remained relatively constant over the past 30 years, and it is an improvement in check plot yield that is associated with higher yield of modern hybrids. This finding has important ramifications in developing breeding programs and in devising crop management strategies for better use of fertilizer N.

Results
These results suggest that continued selection for grain yield has also improved the biofuel potential of corn by favoring increased grain starch concentration. Current criticism of expanded

corn production for biofuel production uses the assumption that the crop requires increasing levels of inputs for high yield. Our work suggests that past and current genetic improvement has not only increased grain yield, but also increased the potential efficiency of corn production by reducing the N required.

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)

Outcome #7

1. Outcome Measures

Developing A Sustainable Method Of Soybean Cyst Nematode Control

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Identification of genes involved in soybean cyst nematode parasitism in the long term will lead to better understanding of SCN/soybean interactions and, potentially, the development of targeted and environmentally sustainable approaches to limit nematode damage to crops.

What has been done
The new SCN metabolic pathways discovered in this project are a first step in the process of developing a sustainable method of SCN control. Any nematode protein that is special or unique in a parasitic nematode may be a useful target for developing a nematode control strategy. These new putative metabolic pathways are a very significant discovery since it seems to suggest that HGT is more common in plant nematodes than originally thought, thus many HGT target genes may be in SCN. Several examples of HGT have been hypothesized to have occurred in plant parasitic nematodes, but none for an entire functional metabolic pathways.

Results
A plant-nematode specific metabolic pathway is a valuable target for disruption via chemical

inhibitors [nematicides] or via genetically engineered plants, since only the parasitic nematode would be affected. That is, if a nematicide were developed to inhibit this pathway[s] it would harm only parasitic nematodes, not beneficial nematodes, and would not be toxic to humans. Further analysis of these new nematode-specific metabolic pathways will be needed to confirm their function and show they are essential for the life of this nematode.

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
216	Integrated Pest Management Systems

Outcome #8

1. Outcome Measures

Increased Knowledge Of Small Acreage Land Management Practices

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	5

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Communities are experiencing growth at the rural/urban fringes. Subdivision of agricultural properties into smaller, one to 50+ acre parcels is encouraging more urban clientele to move to rural areas. The small scale acreage owner may have purchased the property for many reasons, from retirement, to a desire to farm, to seeking an alternative income, or for change in lifestyle. This growing audience of small acreage owners is often not well versed in land management practices or entrepreneurial skills. A consistent message across the state on the best management recommendations for small acreages is needed to help landowners make wise, informed decisions while minimizing environmental impact.

What has been done
Living on the Land, a 13-week program series developed in Nevada, was adopted and modified to include information on best land management practices for Illinois conditions and laws. The course includes sessions on goal-setting, soils, wells and septic systems, local laws and

regulations, water quality, streams and ponds, lawn management, pastures and managed grazing systems, animal husbandry, wildlife conservation and concerns, marketing and economics, and sustainability. The program includes a trainer manual and participant notebooks as well as PowerPoint slides covering eight module topics. Resource lists were also created for each of the module topics to include Illinois resources. In addition, resource materials were placed on Extension's Small Farms website. Twenty-two educators from Extension, Soil and Water Conservation Districts, and The Land Connection participated in a two-day training on implementing the program using the various materials in five locations in the state. A retrospective pre-post evaluation was distributed at the end of the program series to gather input on improving future training programs. A follow-up evaluation will be conducted to collect data on practice adoption.

Results

The Living on the Land program was advertised in seven locations in the state. Attendance at the pilot program offered in the late fall of 2009 included 18 participants. A second program accommodated twelve participants representing seven land properties. Enrollment response at the five other sites was inadequate resulting in the cancellation of the program, partially as a result of uncertainty related to reorganization and staff reductions in University of Illinois Extension as well as the challenges of distributing program registration information to those who are likely not familiar with Extension.

4. Associated Knowledge Areas

KA Code	Knowledge Area
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
216	Integrated Pest Management Systems
604	Marketing and Distribution Practices

Outcome #9

1. Outcome Measures

Expansion/Adoption/Development Of Outreach Programs For Small Farmers And Ranchers

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	80

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Small farmers and ranchers are increasing in number, may lack resources, and may be newly engaged in food production, thus lacking knowledge to be successful in their chosen income-producing endeavors.

What has been done
The 5th National Small Farm Conference 'Roadmap to Success for Small Farmers and Ranchers' was held in September of 2009 in Springfield, Illinois. The conference, held every three to four years, brought together land grant universities, community-based organizations and other stakeholders who work with small farmers and ranchers. The conference aimed to strengthen collaboration and partnership among groups and provided an opportunity to share new ideas in research, Extension and outreach. The conference format featured a pre-conference short course, concurrent sessions, posters, exhibits, plenary sessions and educational tours and was a joint endeavor with multiple USDA agencies, University of Illinois Extension, The Farm Credit Council, Illinois Department of Agriculture and the SARE Program.

Results
All registrants were invited to complete a post-conference online survey two weeks after the conference ended. A total of 264 [45%] of the 583 conference attendees responded to the online survey. A third evaluation stage involving a six-month post-conference follow-up was completed this year using a slightly modified version of the post-conference online evaluation to assess the impact of the conference participants work with small-scale farmer and ranchers. A total of 165 [28%] of the participants completed the 6-month follow-up.

Participants reporting taking one or more of six actions was between 30% and 60% of the number that planned to take such actions as reported two weeks after the conference. The results from the 6-month follow-up suggest that while the respondents' enthusiasm led them to overstate what they could realistically accomplish, there was a respectable level of accomplishment in every category. Results of respondents actual reported actions include the following: [1] 80 [14%] of the 583 conference attendees extended an existing program to better meet the needs of small scale farmers; [2] 77 [13%] were now partnering or collaborating with someone identified at the conference; [3] 57 [10%] adapted an existing program to better meet the needs of small scale farmers; [4] 44 [8%] completed a funding request for a new or existing program; [5] 28 [5%] designed and implemented a new education or outreach program; and [6] 25 [4%] adapted an existing program to target an underserved populations.

4. Associated Knowledge Areas

KA Code	Knowledge Area
111	Conservation and Efficient Use of Water
204	Plant Product Quality and Utility (Preharvest)
604	Marketing and Distribution Practices

Outcome #10

1. Outcome Measures

Increased Access Among Food-Related Enterprises

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Linking food producers with processors, retailers, consumers, and other food supply chain participants is critical in meeting the need for fresh and adequate food.

What has been done
MarketMaker, an interactive web-based multi-state market system developed by the University of Illinois and launched in Illinois in 2005, locates businesses and markets for agricultural products. The data currently encompasses 489,942 profiles of farmers and other food-related enterprises in Illinois, Iowa, Georgia, Mississippi, Nebraska, Kentucky, Michigan, Indiana, Ohio, and New York that can be queried by users. Arkansas, Colorado, Florida, Louisiana, Pennsylvania, South Carolina, Washington DC, and Texas and Alabama are under development. The database can be searched by type of facilities, offerings and activities, and shopping. This past year several actions were initiated to improve this outreach effort. To build awareness among non-farm food-related enterprises, MarketMaker was demonstrated to sixteen major national and/or state enterprises.

Working groups were created to design new business registration templates to be captured within the MarketMaker database. A training program was created to prepare farmers to become more commercial or retail ready. The materials developed in conjunction with the University of Kentucky include best practices and a readiness checklist that helps them align production, food safety, and marketing practices with what is expected and desired by supply chain decision makers beyond the farm gate. Templates were also constructed for nonfarm food businesses across all sectors of the food industry to capture the kinds of information that help supply chain players identify potential likeminded collaborators through the MarketMaker database.

Results

Five states have adopted the use of the retail/commercial ready curriculum and three of those states have reported that approximately 175 farmers have completed the training. The 59 new profile designs have enabled expansion of profiles across all sectors and at each step of the food supply chain that now includes 16,958 unique user profiles. The site now also features over 1,000 businesses with agri-tourism profiles. In addition, the introduction of the fish and seafood industries into the MarketMaker system coincided with the Gulf Oil Spill and played an active role in economic recovery activity. Thirty-four educators and practitioners were trained to work with the Gulf seafood industry.

4. Associated Knowledge Areas

KA Code	Knowledge Area
604	Marketing and Distribution Practices

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

1. Evaluation Studies Planned

- Retrospective (post program)

Evaluation Results

A survey of practice changes was distributed for completion prior to beginning private applicator training sessions this year. The 452 completed surveys represent approximately 9% of those who completed the training and had participated in previous training sessions. In response to the question 'Because of knowledge gained in previous PSEP training sessions, I have made the following practice changes' respondents could check up to 15 practice changes. Results follow:

86.2% [370] read and follow label directions for proper pesticide application methods and rates,
84.4% [362] take precautions to minimize spray drift when making pesticide applications,
84.1% [361] understand how pesticides can cause contamination and take steps to prevent it,
81.1% [348] determine proper identification of pests before determining if control is needed,
77.9% [334] mix and load pesticides in a well-lit open-air area to minimize exposure,
76.0% [328] know how to respond to pesticide exposures if they should occur,
72.5% [311] store pesticides in a secure location separate from any feed stuffs,
69.7% [299] use recommended personal protective equipment when working with pesticides,
68.5% [294] refer to treatment thresholds to decide if a pest needs to be controlled,
68.3% [293] calibrate their sprayer regularly to ensure accurate application rates,
67.8% [291] inform family, friends, employees of the safety precautions to follow,
58.5% [251] thoroughly examine my fields to determine the distribution of a pest population,
57.1% [245] have adopted IPM practices in managing pests in my farming operation,
56.6% [243] adjust cultural practices whenever practical to control/mange pest populations,
56.6% [243] select the safest pesticides possible to control/manage pest populations,
35.4% [152] have their pesticide storage areas prominently labeled and secured.

One hundred sixty-seven of the respondents indicated that they had saved money by successfully passing the private applicators exam and applying appropriate pesticides when necessary to their farming operation. Estimated dollars saved totaled $2,455,620 which averages to slightly over $14,700 per operation. The 349 respondents who provided information on acres treated with pesticides reported application to 298,831 acres.

Key Items of Evaluation

Although private pesticide applicators would prefer not to take the required Illinois Department of Agriculture administered certification exam every three years nor the optional training provided by Extension, those who attended recertification training and completed a survey indicated that the information taught during the training had been applied as a part of their farming operation. Although some of the practices applied relate to regulations concerning pesticide use, others clearly reflect actions taken to protect themselves, their friends, family, neighbors, livestock, and the environment from contamination. Attention needs to be given to address how to increase the prominent labeling of pesticide storage areas in future trainings.