2010 Purdue University Combined Research and Extension Annual Report of Accomplishments and Results

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I. Report Overview

1. Executive Summary

EXECUTIVE SUMMARY

At Purdue University, professors, scientists, staff and students work to reveal new knowledge and develop new methods for transferring that knowledge to the local and global communities. The following overview highlights a portion of our efforts in integrated programs, combining achievements in science with service to students and society. These efforts are the result of diverse collaborations among many individuals and organizations from academia, government, industry and community stakeholders. From our University and College Strategic Plans, we:

• Launch tomorrow's leaders by enhancing student success with careers in a dynamic global society, as well as foster intellectual, professional and personal development for lifelong learning.

• Promote discovery with delivery by conducting field-defining research with breakthrough outcomes and catalyze research-based economic development and entrepreneurship.

• Meet global challenges by enhancing Purdue's presence and impact in addressing grand challenges of humanity.

GLOBAL FOOD SECURITY AND HUNGER: Boost US agricultural production, improve global capacity, and foster innovation in fighting hunger

According to the U.S. Department of State, nearly one sixth of the world's population, 1 billion people, suffer from chronic hunger. In addition, the world population is expected to increase by another 2-3 billion in the next 40 years. Plant, animal and food production systems as well as transportation/distribution systems will need to become more efficient to meet the increasing demand for food worldwide. Development of a comprehensive food production enterprise is required to keep food affordable while reducing the environmental impact from food production.

Low resource farmers in Africa lose up to 50% (http://www.gatesfoundation.org) of their cowpea production to weevils during storage. Researchers have confirmed that triple bagging of cowpea grain using PICS (Purdue Improved Cowpea Storage bags) strongly suppresses the development of damaging populations of cowpea weevils in stored cowpea as well as other weevils feeding on maize and wheat. Initially the project helped finance PICS bag orders for distributors, but by 2010 the distribution system was entirely in the hands of African entrepreneurs. The PICS bags have not only substantially reduced crop losses but have created a new economic engine through the sales and distribution of PICS storage bags.

Corn and sorghum are poised to play key roles in agricultural development and food security world-wide. The role of these crops is expanding as genetic, genomic and agricultural technologies are developed and transferred to targeted regions throughout the world. Research and training is required to deploy genetic technologies that will enhance the value and performance of these crops in farmer accepted varieties. Striga (witchweed) is the most common and economically damaging pest in food production in the tropics and Africa, reducing yields by 65-100% in a growing season (http://www.kari.org/fileadmin/publications/tech_notes/TecNote19_20060810.pdf). Purdue researchers have developed a

low-dose metsulfuron seed coating that when applied to herbicide tolerant sorghum varieties, is shown to be highly effective in field and greenhouse trials against Striga emergence.

The most highly consumed meat in the world in 2009 was pork (http://www.fas.usda.gov). Research to enhance the efficiency of dietary nutrient utilization in pork demonstrates that an active transport system for phosphorus exists in the gastrointestinal tract. These results are leading to improved feeding and management programs where phosphorus absorption is enhanced and excretion is reduced. The research to enhance phosphorus utilization by animals has also had an impact on our understanding of late stage kidney failure in humans. This has led to an enhanced understanding of the mechanisms underlying phosphorous absorption by the gastrointestinal tract and has led to dietary recommendations that have the potential to improve phosphorous balance and minimize stress on kidneys in humans.

CLIMATE CHANGE: Develop an agriculture system that maintains high productivity in the face of climate changes while sustaining economic vitality.

Characterizing the potential impacts on the global environment associated with changes in climate is both complex and vital for developing highly productive agricultural systems and requires the understanding of, and managing for, the political, regulatory, social, and economic influences at the local, regional, and watershed levels. Many concepts that students learn in our soil, crop and environmental courses are inherently spatial, but the ability to make these patterns clear has been limited. The Integrating Spatial Educational Experiences (Isee) website was developed as a fast, easy-to-use tool which allows instructors to incorporate spatial concepts into key courses such as Agronomy, Crop Science, Soil Science and Soil Classification. Students have demonstrated significantly better awareness of spatial aspects after using Isee than before the tool was available.

Shifts in weather patterns, an example of climate change, may be a result, in part, due to land-use changes. Urban hydrologists have long demonstrated a connection between urban development and the increasingly fast runoff during rain events due to the lack of land available to absorb water. Purdue researchers are investigating how urban development influences precipitation patterns themselves, which can further increase flooding depending on the spatial orientation of urban environments. This research will impact the choice of models used for numerical weather prediction and flood forecasting in urban environments and could impact design guidelines and zoning regulations used by land use planners and municipal wastewater districts.

Soil is affected by, and contributes to, climate change as the single largest repository of carbon worldwide. It is a critical link in the hydrologic cycle and a major driving force of soil formation and soil ecosystem functions. Purdue researchers have developed a new method of mapping soils, Terrain Attribute Soil Mapping, based on disaggregating current soil survey information and combining the data with digital elevation model terrain attributes to make soil attribute predictions based on natural soil properties, land use and anthropogenic impacts. This new method is more suitable for carbon accounting, hydrologic modeling and precision agriculture because predictions are made as continuous properties across a landscape which allows individuals to more accurately account for changes in carbon pools which impact climate change.

Anaerobic digestion allows farmers to create renewable energy and significantly reduce manure methane emissions. Recognizing the financial implications of these market opportunities and the drivers behind farmer and lender decision-making is important for understanding adoption rates of anaerobic digesters. Researchers examined the potential supply of carbon dioxide offsets from anaerobic digestion on US dairy farms to create a better understanding of the potential marketplace for anaerobic digestion in the US. Under base assumptions, offset prices in excess of $15 per ton of carbon captured would be required to reduce methane emissions from manure storage by 50% from 2005 levels.

SUSTAINABLE ENERGY: Develop biomass used for biofuels, design optimum forest products and crops for bioenergy production, and produce value-added bio-based industrial products.

Purdue University takes a comprehensive approach to sustainable energy research. Four colleges, 23 departments, and numerous industrial partners tackle the bioenergy supply chain and include disciplines from feedstock processing through information processing in concert with policy economics and environmental impacts.

It is widely acknowledged that transitioning to renewable fuels will require a continuum of products and technologies. One strategy showing promise is extracting hydrogen from dining hall food waste. This process should have significant value for waste processing and heat production. Organic waste material is used in an anaerobic process to produce hydrogen. Research to maximize hydrogen production is ongoing and a laboratory scale batch/continuous fermentor is being used for testing and to consider scale up issues.

Purdue Extension educators conducted 180 farm energy audits in 13 states to evaluate the energy that could be saved in both fuel and electricity by replacing the current dryer with a new one. Audits revealed opportunities for a single farmer to save an average of 362 billion BTU's in fuel and electricity when replacing an old dryer. The average annual cost for operating the new dryer was reduced by 41% for each producer. Many producers use this data to apply for USDA REAP grants for dryer replacement.

Cellulosic biomass could be produced for biofuels feedstock at a rate of up to one billion tons annually through agriculture and forestry in the US. The rigid structure of these cellulosic materials requires the use of various catalysts in complex chemical reactions to extract the component sugars. Xylose, a major sugar comprising up to 40% of the sugar in cellulosic biomass, must be extracted at high yields. The extracted xylose is converted into a chemical, furfuraldehyde, which has potential value as a feedstock for bioplastics and biofuels. Purdue researchers tested maleic and sulfuric acids in different biomass types--grasses, softwood and hardwood (switchgrass, lodgepole pine and poplar). The xylose yields from switchgrass exceeded 80%; wood yields were greater than 90%. In comparison, sulfuric acid yields ranged from 60-75% for the same products. These results indicate that the careful design or selection of an acid catalyst, such as maleic acid, can significantly improve the yields of desired chemical feedstocks from plant biomass. Further work is underway to understand the mechanisms that underpin the improved performance so that the newer catalysts can be designed and improved for processing plant biomass.

CHILDHOOD OBESITY: Ensure that nutritious foods are affordable and available and Americans have information to make informed, science-based decisions about their health and well-being.

In 2009, approximately 30% of the Indiana population was categorized as obese, an increase of 3% from 2008, according to the CDC's Behavioral Risk Factor Surveillance System. In addition, almost 14% of Indiana children in ninth-twelfth grade are classified as obese http://www.cdc.gov/obesity/stateprograms/fundedstates/indiana.html. Any long-term solution to childhood obesity must include a range of scientific and behavioral factors that address physiological, sociological and economic factors and the complex relationship between them.

Obesity is a consequence of many dysregulated biological processes, including an increase in oxidation and inflammation. Obesity could be reduced by decreasing inflammation and oxidation. Research is underway on curcumin (the active ingredient in turmeric powder) which has been shown to be a potent antioxidant and anti-inflammatory whose properties suggest that it may be beneficial to prevent obesity.

Educating children about food and nutrition while working with them on healthy eating habits will likely impact their food habits as teens and adults. Third-grade teachers working in collaboration with Extension educators created a garden-based education program where students grow and then consumer their own vegetables. Over 230 children in 35 Indiana counties participated in Purdue's Eat Your Way to Better Health (EYWTBH) 6 week program. Post survey results indicated that individual consumption increased from 5.3 to 6.4 fruits weekly and 4.4 to 5.5 vegetables per week.

A new, collaborative, multistate (Indiana, Kansas, Michigan, North Dakota, Ohio, South Dakota, and Wisconsin), multidisciplinary team of nutrition scientists, community development specialists, and family and youth development specialists from the North Central region are mobilizing rural low income communities to assess and improve the ecological environment to prevent childhood obesity. They are developing an innovative, integrated research and Extension project that will implement a community development model of Extension intervention to prevent childhood obesity; use a quasiexperimental design in seven states to examine outcomes; and, utilize online distance learning tools such as eXtension to document and disseminate best practices to energize and improve the professional development of Extension staff working to prevent childhood obesity.

FOOD SAFETY: Reduce the incidence of food-borne illness and provide a safer food supply.

According to the Centers for Disease Control and Prevention, one in six people (48 million) in the United States suffer from food-borne illness each year, more than a hundred thousand are hospitalized, and thousands die (http://www.cdc.gov/media/pressrel/2010/r101215.html). The research, education and Extension portfolio of Purdue University has been and will continue to be important to the work of the FDA in keeping the US food supply safe. Our expertise spans across a continuum of disciplinary expertise, from basic microbiology to public sector technology transfer directed at producers, distributors and consumers of food.

The development of systems that can rapidly detect food borne bacteria, toxins and other pathogens-intentionally or accidentally introduced--is critical to protecting the food supply all along the chain. Purdue researchers are developing biosensors that allow the simultaneous detection of multiple pathogens and toxins using a single instrument. A mammalian cell-based biosensor and light scattering sensor have been developed to detect pathogens including Salmonella, E. coli, L. monocytogenes and Vibrio (cholera). This technology speeds up the detection process from several days to less than 24 hours. The research is now being leveraged to build high-throughput screening tools that will allow food to be screened within hours rather than days with little impact on time to market.

Educating food handlers on safe handling practices is an important, and necessary, form of preventive health education. Purdue Extension educators continue to work closely with food managers through the ServSafe Retail Food Safety Recertification Program. In Johnson County, Indiana, 427 of 454 (94%) participants successfully completed the recertification program. A three month post training survey indicates most participants had incorporated new behaviors into their work including: washing hands more frequently (85% did this more often), checking temperature (for heating 82% and cooling 81%) of food, separating raw from ready-to-eat foods (76%), and making sure all work surfaces, equipment and utensils were cleaned and sanitized before next use (68%).

SPECIAL NOTE: Purdue's internal reporting system for faculty, educators and Extension staff began its transition during 2010 to reflect NIFA's five priority areas. The information in the following report for 2009-2010 reflects this transition. Of note, we were unable to capture much of the quantitative information under several program areas, but were able to provide qualitative data to reflect our activities and impacts.

Total Actual Amount of professional FTEs/SYs for this State

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	130.9	0.0	238.5	0.0
Actual	77.8	0.0	277.5	0.0

II. Merit Review Process

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

- Internal University Panel
- External Non-University Panel
- Combined External and Internal University External Non-University Panel

2. Brief Explanation

III. Stakeholder Input

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

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

Brief explanation.

{NO DATA ENTERED}

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
- Open Listening Sessions
- Needs Assessments

Brief explanation.

{NO DATA ENTERED}

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

Brief explanation.

{NO DATA ENTERED}

3. A statement of how the input will be considered

- To Identify Emerging Issues
- Redirect Extension Programs
- Redirect Research Programs
- In the Action Plans
- To Set Priorities

Brief explanation.

Brief Explanation of what you learned from your Stakeholders

Stakeholders continue to recognize and value Purdue as a trusted source of informtion on priority issues for agriculture, families, youth and communities. They continue to ask us to research critical topics and share the information with people in a variety of ways. Research and Extension programs described in this report reflect key concerns of stakeholders in Indiana and the nation. Stakeholders continue to encourage us to focus efforts on relevant issues to maximize resoruces.

IV. Expenditure Summary

1. Total Actual Formula dollars Allocated (prepopulated from C-REEMS)			
Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
8791631	0	5677805	0

2. Totaled Actual dollars from Planned Programs Inputs				
	Extension		Research	
	Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
Actual Formula	7873193	0	4981769	0
Actual Matching	12068233	0	21447380	0
Actual All Other	2031396	0	7964197	0
Total Actual Expended	21972822	0	34393346	0

3. Amount of Above Actual Formula Dollars Expended which comes from Carryover funds from previous				
Carryover	3450644	0	1678034	0

V. Planned Program Table of Content

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Childhood Obesity

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	10%		10%	
502	New and Improved Food Products	10%		10%	
607	Consumer Economics	10%		10%	
610	Domestic Policy Analysis	5%		5%	
701	Nutrient Composition of Food	5%		5%	
702	Requirements and Function of Nutrients and Other Food Components	10%		10%	
703	Nutrition Education and Behavior	20%		20%	
806	Youth Development	30%		30%	
	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	1.6	0.0	11.5	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**
403550	0	270050	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
809841	0	1161109	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
119152	0	253785	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conducted research
- Developed curricula, publications, web sites, and distance education materials
- Conducted educational workshops, seminars, short courses, and conferences
- Partnered with other agencies interested in childhood obesity
- Worked with media
- Published articles

2. Brief description of the target audience

- Parents
- Youth
- Children
- Day Care Providers
- Consumers
- Healthcare Providers
- State and county health departments
- Professional organizations

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1673	0	136	0

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

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	17	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational workshops

Year	Actual
2010	2

Output #2

Output Measure

- Number of research publications

Year	Actual
2010	17

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

Outcome #1

1. Outcome Measures

Number of new fruits and vegetables consumed by 3rd graders

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	230

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Childhood obesity is a nationwide problem, with rates tripling in the past 30 years. Fourteen percent of Indiana teens (2007) were considered overweight, 82% didn't eat recommended amounts of fruits and vegetables and 56% didn't engage in recommended physical activity. Educating children about food and nutrition at an early age will likely impact their activities as teens.

What has been done
Garden-based education programs have shown that when students plan and harvest their own fruits and vegetables, they are more likely to eat them. Purdue's Eat Your Way to Better Health (EYWTBH) 6 week program worked with 3rd grade teachers in 35 Indiana counties to increase consumption of fruits and vegetables. EYWTBH consisted of 3 components: nutrition education materials for farmer's market consumers, school salad bars and a school garden program.

Results
Student pre- and post-surveys indicated a significant increase in weekly fruit and vegetables. On average, the students increased consumption from 5.3 to 6.4 fruits weekly and 4.4 to 5.5 vegetables per week.

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics
703	Nutrition Education and Behavior
806	Youth Development

Outcome #2

1. Outcome Measures

Number of Child Care providers that plan to review and change menu's to improve children's eating habits.

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}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Children often receive between 1/2 to 2/3 of their daily nutrition from child care programs. Many child care providers aren't confident in how to provide nutritious food items that meet Child and Adult Care Food program (CACFP) requirements that fit in their budget and that the kids will enjoy. Childcare food service providers must have the knowledge and skills for planning and preparing healthy and appealing meals and snacks.

What has been done
16 child care centers were provided training on how to improve the nutrient value of their menus while staying in budget and creating a fun and educational environment for the kids. (R.E.C.I.P.E. for Growing Healthy Children program)

Results
Post survey results showed that 81% of participants planned to review their menus and make healthy changes such as increasing the number of times whole grains and whole fruits were being offered and decreasing the fat content of the milk and meats provided.

4. Associated Knowledge Areas

KA Code	Knowledge Area
607	Consumer Economics
701	Nutrient Composition of Food
703	Nutrition Education and Behavior
806	Youth Development

Outcome #3

1. Outcome Measures

Number of novelty dietary food compounds that could inhibit and/or prevent obesity

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)
Adipogenesis is the process by which adipose tissue converts to fat cells.It is common knowledge that reducing calorie intake and increasing exercise are the predominant routes to inhibiting and reducing obesity. These actions are not always sufficient and it's of interest to identify other mechanisms for reducing the conversion of adipose tissue. Identifying minerals and bioactive compounds that could impact the production of fat cells is of significant interest.

What has been done
Curcumin and Selenium have been tested in vitro to determine if they inhibit the conversion of adipose tissue to fat cells with positive results. The same results have not been demonstrated yet in vivo.

Results
Research results demonstrate that curcumin is a safe bioactive compound found in tumeric and reduces the conversion of adipose tissue (adipocyte cells) to fat in the early stages. Selenium, an essential mineral found in the soil and uptaken by plants, works as an inhibitory and preventive micromineral which modulates the transcriptional program (DNA programming) that occurs during adipocyte differentiation. The researchers are working to understand the molecular basis underlying adipogensis and to reproduce these results in vivo.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 2

1. Name of the Planned Program

Climate Change

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	10%		10%	
112	Watershed Protection and Management	5%		5%	
123	Management and Sustainability of Forest Resources	10%		10%	
132	Weather and Climate	10%		10%	
135	Aquatic and Terrestrial Wildlife	10%		10%	
201	Plant Genome, Genetics, and Genetic Mechanisms	10%		10%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	10%		10%	
212	Pathogens and Nematodes Affecting Plants	5%		5%	
213	Weeds Affecting Plants	5%		5%	
306	Environmental Stress in Animals	5%		5%	
605	Natural Resource and Environmental Economics	15%		15%	
610	Domestic Policy Analysis	5%		5%	
	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	5.6	0.0	14.0	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**
582620	0	221780	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
995438	0	1566361	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
176587	0	382887	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conducted meetings, conferences, workshops, seminars
- Published research articles and Extension publication
- Established web sites
- Organized field days
- Worked with mass media
- Partnered with other interested organizations and associations

2. Brief description of the target audience

- Producers
- Consumers
- Youth
- Elected officials and policy makers
- Professionals

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	22244	0	2792	0

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

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	10	10	11

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational workshops

Year	Actual
2010	2

Output #2

Output Measure

- Number of Extesnion publications written, new or revised

Year	Actual
2010	10

Output #3

Output Measure

- Number of research publications

Year	Actual
2010	10

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

Outcome #1

1. Outcome Measures

Number of AFO's able to comply with federal regulatory requirements

2. Associated Institution Types

- 1862 Extension
- 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)
Several Federal regulations require animal feeding operations to report emissions when a threshold of daily emissions is reached. The evaluation of a given farm to exceed this threshold is based on a small number of short-term gas emissions studies which may not be the best possible baseline.

What has been done
Ten AFO lagoons and basins were measured over the course of 2.5 years to determine the emisssions variability over the day and seasons to provide baseline emissions measurements for the USEPA to develop estimating methods for AFO's.

Results
These results are being incorporated into the measurement methods being developed by USEPA to more accurately estimate AFO emissions and comply with federal regulatory requirements. This approach could achieve compliance with environmental laws much faster than any other enforcement mechanism.

4. Associated Knowledge Areas

KA Code	Knowledge Area
112	Watershed Protection and Management
610	Domestic Policy Analysis

Outcome #2

1. Outcome Measures

Number of management practices that can have a postive impact on water quality

2. Associated Institution Types

- 1862 Extension
- 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)
Land use cover is changing at a rapid pace due to increased urbanization and demand for biofuel production. There is a need to evaluate various management practices that can be implemented to minimize unintended consequences to hydrology and water quality.

What has been done
1. Watershed models (Soil and Water Assessment Tool; GLEAMS-NAPRA) have been developed and applied in various Indiana and Arkansas watersheds.
2. An assessment of Conservation Effectiveness Assessment Programs (CEAP) have been made for one of the USDA-NIFA funded CEAP watersheds.
3. Decision support tools are developed to evaluate effects of land management decisions on hydrology and water quality in agricultural and mixed land use watershed.

Results
Project results have increased knowledge of conservation practices and their impacts on water quality. Decision support tools are now being used to develop total maximum daily loads (TMDLs).

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
112	Watershed Protection and Management
610	Domestic Policy Analysis

Outcome #3

1. Outcome Measures

Number of new weed management strategies in organic agriculture

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)
There is a critical threshold period for controlling weeds to protect yields;once the critical threshold has passed, little weeding is conducted; weeds re-emerge and produce prolific seed banks for the subsequent seasons. Closed canopy strategies are ideal for organic crops for supressing germination. Most vegetable crops are planted in widely spaced rows where closed cover canopies are nonexistent. Subsequent prolific weed emergence requires new organic management strategies.

What has been done
Pioneering research is being conducted using intercropping of live cover crops such as buckwheat and clover between crop rows in tomatoes and bell peppers examining the effect of intercrops on weed seedbanks, crop yields. When legumes are intercropped, they also examine soil fertility.

Results
Intercropping plus mowing provided good suppression of weeds that emerge late in season and reduced the seed banks for the following season. The next phase is to look at other potential intercropping species such as red and white clover that provide additional nitrogen into the soil.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
213	Weeds Affecting Plants

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Food 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
201	Plant Genome, Genetics, and Genetic Mechanisms	5%		5%	
204	Plant Product Quality and Utility (Preharvest)	5%		5%	
212	Pathogens and Nematodes Affecting Plants	5%		5%	
216	Integrated Pest Management Systems	5%		5%	
308	Improved Animal Products (Before Harvest)	10%		10%	
501	New and Improved Food Processing Technologies	20%		20%	
503	Quality Maintenance in Storing and Marketing Food Products	10%		10%	
504	Home and Commercial Food Service	10%		10%	
607	Consumer Economics	5%		5%	
702	Requirements and Function of Nutrients and Other Food Components	5%		5%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	5%		5%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	15%		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	5.1	0.0	7.9	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
558541	0	180115	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
936501	0	1117770	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
196046	0	358174	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Conducted research projects and programs that emphasized our key interest areas including detection and control of foodborne pathogens.
• Developed and delivered a variety of educational workshops and seminars to targeted audiences.
• Developed web-based and distance education materials
• Partnered with important stakeholders
• Published research results

2. Brief description of the target audience

• Animal production personnel
• Plant production personnel
• Food manufacturing and processing plant personnel
• Food service and food retail workers
• Consumers
• Youth
• State and county health departments
• Federal regulatory officails
• State industry associations
• First responders

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	432400	0	410	0

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

Patent Applications Submitted

Year: 2010
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	17	18	8

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational workshops

Year	Actual
2010	67

Output #2

Output Measure

- Number of Extension publications written, new or revised

Year	Actual
2010	17

Output #3

Output Measure

- Number of research publications

Year	Actual
2010	18

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

Outcome #1

1. Outcome Measures

Number of flour mill pest managers that can justify increasing their sanitation budgets.

2. Associated Institution Types

- 1862 Extension
- 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)
Protection of food from insect pests is important because insects may carry disease and other micro-organisms, are allergens and are considered unacceptable by the general public.

What has been done
Researchers spent the past 12 months documenting the importance of sanitation in managing pest problems in flour milling facilities. The intention is to provide flour mill pest managers with sufficient data to increase their sanitation budgets.

Results
The data confirms that facilities that improve their sanitation programs have fewer reported insects captured by their monitoring programs and get a considerable increase in the longevity of their fumigation rebound. This research also brings together quality control and sanitation departments--departments that do not usually have common ground.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
503	Quality Maintenance in Storing and Marketing Food Products

Outcome #2

1. Outcome Measures

Number of hours to detect food-borne bacteria, toxins and other pathogens in food

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)
Food borne pathogens can be introduced into the food supply--intentionally or unintentionally--making tens of thousands of individuals sick. These pathogens include Salmonella, E. coli, Listeria monocytogenes, and Vibrio (cholera). Current technology allows for the identification of individual pathogens in food and can
take several days and infect many individuals before pathogen is known.

What has been done
Purdue researchers have developed bio-sensing applications that allow for the simultaneous detection of multiple pathogens using a single sensor platform.

Results
The technology has the potential to speed up the detection process from several days to less than 24 hours and to test more than one pathogen at a time. This technology could signficantly reduce the length of time to manage the issue along the entire food chain and is now being leveraged to build high-throughput screening tools that will allow more food to be screened more rapidly with little impact on time to market.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

Outcome #3

1. Outcome Measures

Number of food service managers that changed behaviors after being re-certified as National Food Protection Managers.

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}	427

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
According to the Center for Disease Control and Protection, 46 million Americans are sickened, 325,000 hospitalized and 5,000 die from food borne illnesses at a cost of $152 billion per year. Education and action at food establishments are critical to reducing the spread of food-borne illnesses.

What has been done
454 people attended the ServSafe Retail Food Safety Recertification Program conducted by Purdue Extension in Johnson County, IN.

Results
427 of 454 (94%) of the participants were successfully recertified. A 3-month follow up survey indicated the following behavior changes:
* 85% washed hands more frequently during food prep vs 28% before training
* 82% checked food temperature to ensure cooked safely compared to 28%
* 81% checked food temperature to ensure cooling vs. 28%
* 76% kept raw food separate from cooked compared to 39%
* 68% cleaned and sanitized work surfaces, equipment and utensils vs. 51%

4. Associated Knowledge Areas

KA Code	Knowledge Area
503	Quality Maintenance in Storing and Marketing Food Products
504	Home and Commercial Food Service
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins

V(H). Planned Program (External Factors)

External factors which affected outcomes

Brief Explanation

{No Data Entered}

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

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 4

1. Name of the Planned Program

Sustainable Energy

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	10%		10%	
131	Alternative Uses of Land	5%		5%	
201	Plant Genome, Genetics, and Genetic Mechanisms	10%		10%	
204	Plant Product Quality and Utility (Preharvest)	15%		15%	
213	Weeds Affecting Plants	5%		5%	
216	Integrated Pest Management Systems	5%		5%	
402	Engineering Systems and Equipment	10%		10%	
511	New and Improved Non-Food Products and Processes	10%		10%	
605	Natural Resource and Environmental Economics	20%		20%	
610	Domestic Policy Analysis	10%		10%	
	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	10.5	0.0	36.6	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**
1128696	0	630228	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1007401	0	2765377	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
189699	0	667617	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conducted meetings, conferences, workshops, seminars
- Conducted research projects
- Published research and extension publications
- Published newsletters
- Organized field days and demonstrations
- Consulted
- Worked with mass media

2. Brief description of the target audience

- Producers
- Consumers
- Youth
- Professionals in fields related energy
- Agribusiness
- Elected officials and public policy decision makers

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	17319	0	1401	0

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

Patent Applications Submitted

Year: 2010

Actual: 3

Patents listed
Benzoate Inducible Promoters, 7,705,203
Vegetable Lipid-Based Composition and Candle, 7,731,767
Methods for Increasing the Yield of Fermentable Sugars from Plant Stover, New Zealand, 562118

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	18	50	3

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational workshops

Year	Actual
2010	7

Output #2

Output Measure

- Number of Extension publications written, new or revised

Year	Actual
2010	18

Output #3

Output Measure

- Number of research publications

Year	Actual
2010	50

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

Outcome #1

1. Outcome Measures

Number of students expressing an increased interest in STEM fields

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	262

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There is a need to introduce middle and high school students to agricultural engineering and the global impact of agriculture on energy, food and water. Technologies used to improve system efficiencies are great examples to get pre-college students interested in careers in science, technology, engineering, and math.

What has been done
Fluid power trainers were developed for use in education outreach programs. The hands-on activities combined pneumatics, water hydraulics, kinematics and kinetics, electronics and computer programming in an engaging problem-solving activity for students in grades 6-12. The students also learned about practical agricultural machinery technologies while highlighting the role of electronic control systems and fluid power.

Results
Twelve outreach programs were offered where over 262 students (grade 6-12) participated. 147 females, 109 males and 62 under-represented minorities self-selected their demographics (several left boxes unchecked). Feedback from the surveys indicated an increase in STEM fields for careers.

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment

Outcome #2

1. Outcome Measures

Number of entities using data to develop or influence policies, regulations, or practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	10

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Biofuels can be controversial and there is a need for objective analysis of the issues surrounding biofuels economics, environmental impacts, and impacts of policy alternatives.

What has been done
Research comparison made between the cost of the GM Volt (a plug-in electric vehicle) with the Toyota Prius (standard hybrid) and Chevy Cobalt (standard gasoline) under the California increasing tier electricity pricing structure. Under this structure, consumers pay an increasing amount for electricity as consumption rises. The GM Volt would be charged on top of all other household electricity use paying the top tier electricity price. The combination of high electricity price and high cost of the GM Volt battery renders the GM Volt less economic over its presumed 10 year life than the other alternatives.

Results
These results have been summarized and cited in numerous national and California media including the New York Times, San Diego Tribune, Los Angeles Times and many trade press outlets. Some California utilities are experimenting with or implementing alternative rate structure or even separate meters for plug-in hybrid vehicles.

4. Associated Knowledge Areas

KA Code	Knowledge Area
605	Natural Resource and Environmental Economics
610	Domestic Policy Analysis

Outcome #3

1. Outcome Measures

Number of BTU's of estimated annual energy savings from on-farm audits

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}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
To improve the energy efficiency of on-farm drying of grain by helping producers conduct energy audits which are used in applying for USDA REAP grants for grain dryer replacement.

What has been done
Purdue Extension educators have conducted 180 farm energy audits in 13 states to document the energy that could be saved in both fuel and electricity when drying grain on-farm by replacing existing driers.

Results
Audits revealed opportunities for individual farmer's to save on average, 362 billion BTU's in fuel and electricity replacing the old dryer. The average annual cost reduction per producer was estimated at 41%.

4. Associated Knowledge Areas

KA Code	Knowledge Area
402	Engineering Systems and Equipment
605	Natural Resource and Environmental Economics

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 5

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
102	Soil, Plant, Water, Nutrient Relationships	10%		10%	
201	Plant Genome, Genetics, and Genetic Mechanisms	10%		10%	
205	Plant Management Systems	20%		20%	
212	Pathogens and Nematodes Affecting Plants	10%		10%	
213	Weeds Affecting Plants	5%		5%	
301	Reproductive Performance of Animals	5%		5%	
302	Nutrient Utilization in Animals	10%		10%	
311	Animal Diseases	5%		5%	
315	Animal Welfare/Well-Being and Protection	5%		5%	
403	Waste Disposal, Recycling, and Reuse	5%		5%	
601	Economics of Agricultural Production and Farm Management	10%		10%	
604	Marketing and Distribution Practices	5%		5%	
	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	30.0	0.0	92.6	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**
2053211	0	2329162	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1801277	0	6215296	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
363517	0	1355590	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conducted educational workshops and conferences
- Conducted research
- Developed distance education and web-based programs
- Published research articles
- Published Extension publications
- Conducted one-on-one consultations

2. Brief description of the target audience

- Producers
- Elected officials and decision makers
- Youth
- Consumers

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	286930	8517906	49289	39703

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

Patent Applications Submitted

Year: 2010

Actual: 3

Patents listed
Apple Tree Named 'Co-op 31', PP20,437
Fast Acting Fluid Control Valve, 7,717,130
Structures with Integral Life-Sensing Capability, 7,752,904

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	140	126	69

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational workshops

Year	Actual
2010	114

Output #2

Output Measure

- Number of Extension publications written, new or revised

Year	Actual
2010	140

Output #3

Output Measure

- Number of research publications

Year	Actual
2010	126

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

Outcome #1

1. Outcome Measures

Number of low-resource African cowpea farmers using PICS (Purdue Improved Cowpea Storage) bags

2. Associated Institution Types

- 1862 Extension
- 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)
Low-resource cowpea farmers need technology for storing grain after harvest to block losses from pests. The technology should be simple, not include insecticides and be low cost.

What has been done
Investigators carried out research to (1) better understand the mode of action of hermetic storage cowpea and other grain using PICS; (2) learn about practical problems associated with the use of PICS and attempt to find ways around them; (3) begin testing PICS with other crops; and (4) assist in training, including the development of informational materials.

Results
Research confirmed that triple bagging of cowpea grain strongly suppresses the development of damaging populations of cowpea weevils stored in cowpea. Extension efforts have continued to spread the PICS technology to millions of farmers in West and Central Africa.

4. Associated Knowledge Areas

KA Code	Knowledge Area
212	Pathogens and Nematodes Affecting Plants
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

Outcome #2

1. Outcome Measures

Number of new technologies available for improving corn and sorghum

2. Associated Institution Types

- 1862 Extension
- 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)
Corn and Sorghum are poised to play key roles in agricultural development and food security world-wide. The role of these crops is expanding as genetic, genomic and agricultural technologies are developed and transferred to targeted regions throughout the world. Research and training is required to deploy genetic technologies that will enhance the value and performance of these crops in farmer accepted varieties.

What has been done
(1) Germplasm and trait development efforts are focused on the use of natural genetic variability for understanding heat/drought stress in these crops. (2) A promising weed management technology is being evaluated that involves the use of herbicide traits for managing weeds and (3) Identification of genetically stable dwarfing alleles are being identified to reduce height mutants.

Results
(1) Genes responsible for "Staygreen"--the ability of the plant to postpone senescence during drought--are being extracted from the natural gene pool to improve drought tolerance of the crop. (2) Low-dose metsulfuron seed coating applied to herbicide tolerant sorghum varieties have been shown to be highly effective in controlling Striga infestation in the field and greenhouse trials and (3) genetically-stable dwarf sorghum cultivars are being developed using novel dwarfing alleles. One allele that produced a highly-stable phenotype is being incorporated into elite sorghum parent lines for deployment in commercial hybrids.

4. Associated Knowledge Areas

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

205	Plant Management Systems
213	Weeds Affecting Plants

Outcome #3

1. Outcome Measures

Number of participants that are able to take new action to improve crop production (Corn, Soybeans, Weed Control)

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}	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Farmers need the latest crop management information to make decisions for their farming operations. Critical, new information is available for farmers in the areas of grain bin safety, grain storage, the new Farm Bill and ACRE, weed control practices and soybean management practices that could impact their management strategies.

What has been done
A Crop Production Conference was held for area crop producers and agribusinesses which covered the topics outlined above.

Results
As a result of the workshop, participants said the information heard:
* increased awareness of grain bin safety procedures (95% of surveyed participants)
* will help me manage grain bins to store higher quality grain (92%)
* increased my knowledge of the new farm bill and my understanding of ACRE (66%)
* will help me improve weed control practices for my operation (98%)
* will help me make soybean management decisions (89%)

58% of participants have experienced an increase in yield, profit, and/or the efficiency of farming operations or agri-business because of the information presented at Crop Production Clinics attended in past years (58%).

4. Associated Knowledge Areas

KA Code	Knowledge Area

212	Pathogens and Nematodes Affecting Plants
601	Economics of Agricultural Production and Farm Management

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

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

Evaluation Results

Key Items of Evaluation

V(A). Planned Program (Summary)

Program # 6

1. Name of the Planned Program

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: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	10.0	0.0	0.0	0.0
Actual	7.7	0.0	0.1	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
555970	0	14756	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1087548	0	515494	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
179068	0	216013	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Develop curriculum •Conduct evaluation/research •Participate in collaborations that have a youth focus •Conduct educational workshops •Provide youth and volunteer training and development •Develop web sites

2. Brief description of the target audience

•Youth --- Grades K-12 •Volunteers •Public/Private School Teachers

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	100350	1414485	415950	460135

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

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	5	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of new/revised curriculum topics

Year	Actual
2010	2

Output #2

Output Measure

- Number of evaluations conducted of 4-H Youth Development programs, events and activities

Year	Actual
2010	30

Output #3

Output Measure

- Number involved in youth focused community collaborations

Year	Actual
2010	19303

Output #4

Output Measure

- Number of quality, educational workshops for youth audiences

Year	Actual
2010	4990

Output #5

Output Measure

- Number of volunteer development opportunities

Year	Actual
2010	1808

Output #6

Output Measure

- Number of camp counselors trained
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Number of volunteers participating in volunteer development opportunities
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Number of youth participating in Career Development Events
  Not reporting on this Output for this Annual Report

Output #9

Output Measure

- Number of youth participating in educational workshops
  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 of youth who increased knowledge of good character traits, goal setting, team work, communication techniques, decision making, and handling conflict
2	Number of 4-H youth who indicate they possess the skills to practice good character, to plan and organize community service activities, and have the skills to be actively engaged in local, state, and national issues
3	Number of youth at the culmination of their 4-H career who report life skills developed through the program, know how to set goals, work cooperatively in a team, communicate effectively, make decisions based on data and the opinions of others, honor individual differences and handle conflict.
4	Number of youth involved in community service activities
5	Number of volunteers who increase their understanding of life skill development, experiential learning, risk management, and group management.
6	Number of volunteers and Extension staff who report improved knowledge and skills in supporting, delivering, and/or managing quality positive youth development experiences and program planning for youth.

Outcome #1

1. Outcome Measures

Number of youth who increased knowledge of good character traits, goal setting, team work, communication techniques, decision making, and handling conflict

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
During the pre teen/early teen years, youth face many issues including peer pressure, assuming responsibility for one's own actions and assuming leadership roles.

What has been done
Programs have been developed to offer youth the opportunity to explore relationships with others and develop skills to assume leadership roles in club and organizational settings. 4 H Jr. Leader Programs that have as a primary target those youth enrolled in grades 8 12 have been designed to specifically target this age group and offer programs and experiences to build important interpersonal skills.

Results
5309 Indiana youth enrolled and participated in their local Jr. Leader program and activities. 36,140 youth indicated when surveyed that after concluding participation in specific 4 H educational programs they had increased their knowledge of good character traits, goal setting, teamwork, communication techniques, decision making, and handling conflict.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #2

1. Outcome Measures

Number of 4-H youth who indicate they possess the skills to practice good character, to plan and organize community service activities, and have the skills to be actively engaged in local, state, and national issues

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Youth who develop decision making skills and positive personal character are more likely to cooperate and work well with others. Learning through team building skills allows youth to begin to recognize and identify needs, concerns and interests of others resulting in success when dealing with others.

What has been done
Programs were conducted in fifth grade classrooms to help students develop skills that prevent antisocial and high risk behaviors. Students are provided with experiences that help them to clarify their roles as citizens, develop decision making skills, interact with positive role models and explore ideas on issues that are relevant to their lives.

Results
6,255 participant evaluations using the Scale of Juvenile Legal Attitudes (pre post test) show that after the program, youth have a better attitude toward laws, law enforcement, the judicial system, and the idea that they must take personal responsibility to abide by laws and report unlawful acts. Additionally, classroom teachers report a positive change in general student attitude after completion.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #3

1. Outcome Measures

Number of youth at the culmination of their 4-H career who report life skills developed through the program, know how to set goals, work cooperatively in a team, communicate effectively, make decisions based on data and the opinions of others, honor individual differences and handle conflict.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of youth involved in community service activities

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	4000	13042

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Learning how to contribute to society to make life better for oneself and others is a valuable life skill. Youth who volunteer are 50% less likely to abuse drugs, alcohol, cigarettes, or engage in destructive behavior (Search Institute, 1995). Youth who volunteer are also more likely to do well in school, graduate, vote, and be philanthropic (UCLA/Higher Education Research Institute, 1991).

What has been done
Indiana 4 H Youth are encouraged to become involved in community by learning to give back to others through community service activities. Activities range from supporting the Operation Military Kids Program by assembling and distributing Hero packs to the children of recently deployed National Guard and Army Reserve units, to conducting events in health care facilities, collecting canned goods for food pantries, providing assistance to community shelters, community beautification and recycling.

Results

Participating teens' presence and involvement in their local communities provides both service and encouragement to individuals who sometimes have difficulty fulfilling basic needs. Teens reported an increased awareness of the level of need in the local community as well as options for serving others. They also indicated they are able to "put a face on poverty" and developed a sense of pride in giving to others. 13,042 youth were directly involved in community service activities.

4. Associated Knowledge Areas

KA Code	Knowledge Area
806	Youth Development

Outcome #5

1. Outcome Measures

Number of volunteers who increase their understanding of life skill development, experiential learning, risk management, and group management.

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Number of volunteers and Extension staff who report improved knowledge and skills in supporting, delivering, and/or managing quality positive youth development experiences and program planning for youth.

Not Reporting on this Outcome Measure

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

{No Data Entered}

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

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 7

1. Name of the Planned Program

Food and Non-Food Products: Development, Processing, Quality, and Delivery

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	31%		31%	
502	New and Improved Food Products	22%		22%	
503	Quality Maintenance in Storing and Marketing Food Products	18%		18%	
504	Home and Commercial Food Service	2%		2%	
511	New and Improved Non-Food Products and Processes	25%		25%	
512	Quality Maintenance in Storing and Marketing Non-Food Products	2%		2%	
	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
Plan	3.5	0.0	14.5	0.0
Actual	0.9	0.0	7.2	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
332297	0	286607	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
867782	0	865412	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
119136	0	300423	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• conduct research • develop programs and conduct workshops • develop extension curricula • provide outreach training programs • establish distance education programs and web-based programs •coordinate meetings with important stakeholders (researchers, industry, farmers, regulatory, etc.) • work with media

2. Brief description of the target audience

•Farmers •Animal production personnel •Plant production personnel •Biofuels processing industry personnel •Food manufacturing and processing plant personnel •Non-food manufacturing plant personnel •Professional engineers •State and county health departments •Federal regulatory officials •State industry associations

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	650	0	200	0

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

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of programs offered to farmers or production agriculture specialists
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of programs offered to the food industry
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of programs offered to the non-food industry
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of research projects on bioprocessing
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Number of research projects on air quality
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Number of research projects on grain storage and processing
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Number of research projects related to dairy products
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Number of research projects related to aquaculture products
  Not reporting on this Output for this Annual Report

Output #9

Output Measure

- Number of research projects related to enology and viticulture
  Not reporting on this Output for this Annual Report

Output #10

Output Measure

- Number of research project related to food processing
  Not reporting on this Output for this Annual Report

Output #11

Output Measure

- Number of research projects related to food quality
  Not reporting on this Output for this Annual Report

Output #12

Output Measure

- Number of workshops offered to the general public

Year	Actual
2010	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of persons gaining knowledge in bioprocessing
2	Number of products produced using new bioprocessing technologies
3	Nnumber of new products produced by new bioprocessing, bioenergy, and biotechnology
4	Number of new bioprocessing techniques used to increase efficiency
5	Number of persons gaining knowledge in food processing and food processing automation
6	Numbers of persons or companies adopting new food automation technologies
7	Number of food and non-food automation technologies used
8	Number of persons gaining knowledge in air quality control systems
9	Numbers of animal production facilities adopting better air quality practices
10	Number of production facilities with improved air quality
11	Number of persons gaining knowledge in grain processing
12	Numbers of persons and companies adopting better grain processing practices
13	Number of persons gaining knowledge in enology and viticulture
14	Number of persons gaining knowledge of government programs
15	Number of persons gaining knowledge of marketing trends
16	Number of persons gaining knowledge of food packaging applications
17	Number of persons adopting one or more best management practices related to viticulture and enology

Outcome #1

1. **Outcome Measures**

Number of persons gaining knowledge in bioprocessing

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Number of products produced using new bioprocessing technologies

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Nnumber of new products produced by new bioprocessing, bioenergy, and biotechnology

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Number of new bioprocessing techniques used to increase efficiency

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. **Outcome Type:**

Change in Condition Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2010	3	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Commercial sterilization of aseptic bulk storage tanks and transport containers is typically performed using Iodophor (iodine and phospohoric acid) solutions. This sterilization method requires flooding the containers with the iodophor. Since the current bulk storage tanks for citrus juices are now approaching over 2 million gallons each, this requires millions of gallons of iodophor that must be discharged to water treatment facilities after the sterilization.

What has been done
An alternative to iodophor flood sterilization of aseptic, bulk juice storage vessels is to use chlorine dioxide gas. The chlorine dioxide gas technology was successfully developed and commercialized in collaboration with Enerfab, Inc. In addition, a gas sterilization procedure was developed for aseptic tranfer vessels, ISO tankers.

Results
In the past year, three facilities have used the new sterilization method. Over 250 ISO tankers, were sterilized with chlorine dioxide gas for aseptic transfer of orange juice. Each bulk tank sterilized with chlorine dioxide gas saves over 1 million gallons of water which was required previously for flood sterilization with iodophor. Each ISO tanker sterilized with chlorine dioxide saves energy in the form of heat required to re-pasturize the juice to prevent spoilage.

4. Associated Knowledge Areas

KA Code	Knowledge Area
511	New and Improved Non-Food Products and Processes
512	Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #5

1. Outcome Measures

Number of persons gaining knowledge in food processing and food processing automation

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Foods, food ingredients and dietary supplements must be safe, nutritious, stable and acceptable throughout the intended shelf-life. However, some common storage conditions and practices may contribute to faster-than-expected degradation of key nutrients, such as vitamin C. It is important to identify conditions in which nutrients degrade, how fast the degradation occurs, and devise strategies to avoid the degradation.

What has been done
Researchers have studied the effects of processing and storage conditions on the structure-function relationships of food ingredients and ultimate food shelf-life, with an increasing focus on the effects and control of water-solid interactions.

Results
This research has significantly increased the understanding of the detrimental effects of moisture on crystalline solids and the synergistic interaction of water with multi-component blends of food and bioactive ingredients. The studies showed for the first time that powdered blends of highly water-soluble food ingredients (including sugars, salts, organic acids, and vitamins) undergo deliquescence, which can lead to enhanced chemical reactivity and physical changes. Vitamin C is commonly added to many food products, and labeling laws often result in overages being added to meet label claims throughout shelf-life, which increases product cost and may exacerbate deliquescence-related instabilities. Improving the stability of vitamin C in complex environments is important for product quality, labeling, nutrient delivery, and cost. This research has produced industry and consumer guidelines for formulation, packaging, and storage conditions of ingredient blends, including wide-reaching press coverage of consumer advice for where to store vitamins to enhance their stability.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies

Outcome #6

1. Outcome Measures

Numbers of persons or companies adopting new food automation technologies

Not Reporting on this Outcome Measure

Outcome #7

1. Outcome Measures

Number of food and non-food automation technologies used

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Number of persons gaining knowledge in air quality control systems

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Numbers of animal production facilities adopting better air quality practices

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

Number of production facilities with improved air quality

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

Number of persons gaining knowledge in grain processing

Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

Numbers of persons and companies adopting better grain processing practices

Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

   Number of persons gaining knowledge in enology and viticulture

   Not Reporting on this Outcome Measure

Outcome #14

1. **Outcome Measures**

   Number of persons gaining knowledge of government programs

   Not Reporting on this Outcome Measure

Outcome #15

1. **Outcome Measures**

   Number of persons gaining knowledge of marketing trends

   Not Reporting on this Outcome Measure

Outcome #16

1. **Outcome Measures**

   Number of persons gaining knowledge of food packaging applications

   Not Reporting on this Outcome Measure

Outcome #17

1. **Outcome Measures**

   Number of persons adopting one or more best management practices related to viticulture and enology

2. **Associated Institution Types**

   - 1862 Extension
   - 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)
Indiana has a vibrant and growing wine industry that contributes significantly to the economic wealth of the state and enhances the livelihood of its residents. Growers and vintners demand up-to-date information on new grape cultivars, sustainability and pest management, winemaking techniques, and marketing strategies.

What has been done
The Purdue Wine Grape Team conducts discovery and engagement in viticulture and enology. Research has led to the discovery of grape cultivars that have improved fruit quality and produce better wines. Regular winery consultaions, analytical services and wine sensory evaluations have been done. Professional workshops and seminars engage the industry several times each year to deliver the latest scientific information. The team continued a successful campaign to create and promote an inaugural Indiana signature wine style. The annual Vintage Indiana wine festival in Indianapolis attracting more than 10,000 people and the Indy International wine competition with 2,700 entries from around the world were held to promote Indiana agriculture.

Results
Wine quality has improved. The Indiana wine industry now contributes more than $72 million to the Indiana economy. Grape and wine production are the fastest growing segments of Indiana value-added agriculture and agritourism. Indiana's wine acreage has increased over the past ten years. Wine production surpassed one million gallons in 2010, a 2,100% increase since 1991. Wine has emerged as a prime example of a high-valued agricultural commodity made in Indiana.

4. Associated Knowledge Areas

KA Code	Knowledge Area
501	New and Improved Food Processing Technologies
502	New and Improved Food Products
503	Quality Maintenance in Storing and Marketing Food Products

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.)
- Other (State & National Priorities)

Brief Explanation

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

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 8

1. Name of the Planned Program

Family Well-Being

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
801	Individual and Family Resource Management	26%		26%	
802	Human Development and Family Well-Being	74%		74%	
	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
Plan	4.0	0.0	4.0	0.0
Actual	7.0	0.0	17.2	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
581287	0	111763	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
969903	0	1805639	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
191479	0	315643	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Conduct workshops •Provide training •Develop web-based and distance educational materials
•Work with the media •Conduct research •Create displays •Collaborate with other agencies

2. Brief description of the target audience

•immigrants •welfare-to-work individuals •job loss individuals •youth •adults •limited resource families •farm families •families in divorce •child care professionals •trainers of child care professionals •policy makers •parents •volunteers that work with parents •elder caregivers •adult children •retirement associations •community leaders •planners

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	53037	0	33016	0

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

Patent Applications Submitted

Year: 2010
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	2	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of staff development opportunties for Extension Educators
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of programs offered to parents, childcare providers, youth, adults, low-wealth households and consumers

Year **Actual**

2010	22

Output #3

Output Measure

- Number of research projects

Year	Actual
2010	12

Output #4

Output Measure

- Number of publications

Year	Actual
2010	19

Output #5

Output Measure

- Number of web sites developed
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Number of new partnerships, coalitions, advisory boards created.

Year	Actual
2010	4

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of participants who increased their knowledge of debt management
2	Number of participants who adopted one or more practices to reduce debt
3	Number of participants reporting decreased debt
4	Number of participants who increased their knowledge of the benefits of saving on a regular basis
5	Number of participants who increased the amount of money they save regularly
6	Number of participants who save regularly as a result of educational programming
7	Number of participants who increased their knowledge of basic personal financial management
8	Number of participants who have established financial goals to guide financial decisions
9	Number of participants who develop a plan for achieving financial security
10	Number of participants who report increased financial security
11	Number of participants who increased their knowledge of child care and how to manage care giving roles and responsibilities
12	Number of participants who increased their knowledge of decision making skills necessary to make quality of life decisions for caregivers and receivers
13	Number of child care professionals who are working toward, who have obtained, or who have renewed the Child Development Associate Credential.
14	Number of participants who increased their knowledge of basic parenting skills
15	Number of participants reporting improved parent-child communication
16	Number of participants reporting significant improvement in satisfaction and quality of parent-child relationships
17	Number of participants who report they will take one or more recommended actions to avoid identity theft

18	Number of participants who developed knowledge of safety and security procedures in an emergency
19	Number of individuals who increased their knowledge about establishing and maintaining healthy indoor air quality
20	Number of adults who have experienced changed attitudes or behaviors in valuing and appreciating differences in others
21	Number of adults who have increased their understanding of human relationships, communications, and leadership styles.
22	Number of adults who have increased their understanding of themselves and others
23	Participants increased saving by $_____
24	Participants reduced debt by $_____
25	Number of participants who report knowing the steps to take if they are a victim of identity theft

Outcome #1

1. **Outcome Measures**

   Number of participants who increased their knowledge of debt management

   Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

   Number of participants who adopted one or more practices to reduce debt

   Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

   Number of participants reporting decreased debt

   Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of participants who increased their knowledge of the benefits of saving on a regular basis

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	14037

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There is a critical need for financial and investment literacy. The current financial crisis has revealed that many people lack the fundamental knowledge to manage their personal finances effectively. In the future people will have to manage their own retirement accounts even more as retirement programs are becoming defined contribution plans, not defined benefit plans.

What has been done
The Indiana Council for Economic Education developed and sponsored a Stock Market Program. Students in grades 4-12 manage a hypothetical $100,000 portfolio of stocks, bonds, and mutual funds. They learn about financial markets and what causes them to fluctuate. There were 14037 sutdents during this reporting year.

Results
Recent research from national data collected from the National Assessment of Educational Progress (NAEP) revealed that the only pedagogical practice that had a significant impact on knowledge was participation in the Stock Market Game. Other new research shows that participation in the Stock Market Game has a significant impact on student knowledge of personal finance and math.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #5

1. **Outcome Measures**

Number of participants who increased the amount of money they save regularly

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

Number of participants who save regularly as a result of educational programming

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

Number of participants who increased their knowledge of basic personal financial management

2. **Associated Institution Types**

- 1862 Extension

3a. **Outcome Type:**

Change in Knowledge Outcome Measure

3b. **Quantitative Outcome**

Year	Quantitative Target	Actual
2010	0	0

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

Issue (Who cares and Why)
FINRA survey data suggest that residents of Indiana are less financially capable compared to the national average. Sixty-four percent of Indiana residents reported not having an emergency fund and 28% reported using one or more non-bank borrowing methods in the last five years.

What has been done
The Where Does Your Money Grow curriculum was developed and implemented. Sessions cover basic money management concepts including spending plans, tracking expenses, and setting goals.

Results
513 participants completed evaluations at the end of the program. Seventy-one percent said they learned how to make a spending plan and 78% learned how to track their expenses. 70% said they were going to try techniques related to developing a spending plan and 77% said they were going to try techniques for reducing spending leaks.

4. Associated Knowledge Areas

KA Code	Knowledge Area
801	Individual and Family Resource Management

Outcome #8

1. Outcome Measures

Number of participants who have established financial goals to guide financial decisions

Not Reporting on this Outcome Measure

Outcome #9

1. Outcome Measures

Number of participants who develop a plan for achieving financial security

Not Reporting on this Outcome Measure

Outcome #10

1. Outcome Measures

Number of participants who report increased financial security

Not Reporting on this Outcome Measure

Outcome #11

1. Outcome Measures

Number of participants who increased their knowledge of child care and how to manage care giving roles and responsibilities

Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

Number of participants who increased their knowledge of decision making skills necessary to make quality of life decisions for caregivers and receivers

Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

Number of child care professionals who are working toward, who have obtained, or who have renewed the Child Development Associate Credential.

Not Reporting on this Outcome Measure

Outcome #14

1. **Outcome Measures**

Number of participants who increased their knowledge of basic parenting skills

Not Reporting on this Outcome Measure

Outcome #15

1. **Outcome Measures**

Number of participants reporting improved parent-child communication

2. **Associated Institution Types**

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	500	712

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
There is a need to understand how family relationships change after youth move out of their parents' home.

What has been done
Researchers explored changes in family relationship qualities as youth transition to adulthood by examining how qualities such as intimacy and conflict change after youth move out of their parents' home.

Results
Researchers found that youth's departure is associated with positive changes in their own relationships with mothers, fathers, and younger siblings. They also found that older siblings' leaving home was related to increased conflict between second-born offspring and their mothers and fathers. Researchers are continuing to examine the data and explore in more depth how entire family systems change following a youth's transition.

4. Associated Knowledge Areas

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

Outcome #16

1. Outcome Measures

Number of participants reporting significant improvement in satisfaction and quality of parent-child relationships

Not Reporting on this Outcome Measure

Outcome #17

1. Outcome Measures

Number of participants who report they will take one or more recommended actions to avoid identity theft

Not Reporting on this Outcome Measure

Outcome #18

1. Outcome Measures

Number of participants who developed knowledge of safety and security procedures in an emergency

Not Reporting on this Outcome Measure

Outcome #19

1. **Outcome Measures**

Number of individuals who increased their knowledge about establishing and maintaining healthy indoor air quality

Not Reporting on this Outcome Measure

Outcome #20

1. **Outcome Measures**

Number of adults who have experienced changed attitudes or behaviors in valuing and appreciating differences in others

Not Reporting on this Outcome Measure

Outcome #21

1. **Outcome Measures**

Number of adults who have increased their understanding of human relationships, communications, and leadership styles.

Not Reporting on this Outcome Measure

Outcome #22

1. **Outcome Measures**

Number of adults who have increased their understanding of themselves and others

Not Reporting on this Outcome Measure

Outcome #23

1. **Outcome Measures**

Participants increased saving by $_____

Not Reporting on this Outcome Measure

Outcome #24

1. **Outcome Measures**

Participants reduced debt by $_____

Not Reporting on this Outcome Measure

Outcome #25

1. **Outcome Measures**

Number of participants who report knowing the steps to take if they are a victim of identity theft

Not Reporting on this Outcome Measure

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)

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 9

1. Name of the Planned Program

Human Nutrition, Human Health, and Well-Being

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
701	Nutrient Composition of Food	1%		1%	
702	Requirements and Function of Nutrients and Other Food Components	30%		30%	
703	Nutrition Education and Behavior	11%		11%	
711	Ensure Food Products Free of Harmful Chemicals, Including Residues from Agricultural and Other Sources	7%		7%	
712	Protect Food from Contamination by Pathogenic Microorganisms, Parasites, and Naturally Occurring Toxins	28%		28%	
721	Insects and Other Pests Affecting Humans	7%		7%	
723	Hazards to Human Health and Safety	16%		16%	
	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
Plan	15.5	0.0	53.5	0.0
Actual	0.4	0.0	10.3	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**
367581	0	450344	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
794462	0	1052789	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
120752	0	236334	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

• Research based programs focused on conducting research experiements and programs emphasizing our key interest areas including:
  • effects of diet and nutrition on human health;
  • beneficial effects of nutrition, funtional foods, and biomedical research,
  • nutrtional impact on chronic diseases including diabetes, heart disease, and obesity.
• A wide variety of programs were delivered to the targeted audiences.
• Partnered with stakeholders.
• Developed workshops and publications.
• Developed web -based and distance education materials.
• Worked with the media.

2. Brief description of the target audience

• Foodservice and food retail workers
• Consumers
• Healthcare providers
• Day care providers
• Nursing homes
• Youth
• State and county health departments
• State industry associiations

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	51024	0	50000	0

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

Year: 2010
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	14	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of nutrition related programs offered to consumers
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of programs offered to the food industry
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of research programs on food safety, human nutrition, and health
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of nutrition related research publications

Year	Actual
2010	5

Output #5

Output Measure

- Number of research publications related to detection of foodborne pathogens

Year	Actual
2010	9

Output #6

Output Measure

- Number of research publications related to control of foodborne hazards
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Number of research publications related to food defense and protection
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Number of nutrition programs offered to foodservice staff
  Not reporting on this Output for this Annual Report

Output #9

Output Measure

- Number of community health coalition events
  Not reporting on this Output for this Annual Report

Output #10

Output Measure

- Number of food safety programs offered to consumers
  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 of persons who increased their knowledge of proper hand washing
2	Number of persons who increased their knowledge of cooking foods adequately
3	Number of persons who increased their knowledge of avoiding cross-contamination
4	Number of persons who increased their knowledge of keeping food at a safe temperature
5	Number of persons who increased their knowledge of storing foods properly
6	Number of participants passing food handler certificate
7	Number of incidents of food borne illness associated with unsafe food handling practices
8	Number of persons who increased their knowledge of the connection between food choices and risk of chronic disease.
9	Number of persons who increased their knowledge of selection and preparation of foods with reduced fat and/or calories
10	Number of persons who increased knowledge of USDA serving sizes
11	Number of participants consuming appropriate USDA serving sizes
12	Number of participants demonstrating ability to choose or prepare foods with reduced fat and/or calories
13	Number of participants with decreased risk factors for chronic disease (including diabetes, heart disease, obesity)
14	Number of participants with decreased chronic disease complications (including diabetes, heart disease, obesity)
15	Number of persons who increase knowledge of the relationship between nutrition and health
16	Number of persons who increased their knowledge of physical activity recommendations
17	Number of persons who adopt one or more practices to improve food choices and activity levels

18	Number of participants that report reduced medical costs because of changes in food choices and activity levels
19	Number of parents who have increased their understanding of how to raise healthy eaters
20	Number of people who increase their knowledge on controlling bed bugs

Outcome #1

1. **Outcome Measures**

   Number of persons who increased their knowledge of proper hand washing

   Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

   Number of persons who increased their knowledge of cooking foods adequately

   Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

   Number of persons who increased their knowledge of avoiding cross-contamination

   Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

   Number of persons who increased their knowledge of keeping food at a safe temperature

   Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Number of persons who increased their knowledge of storing foods properly

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

Number of participants passing food handler certificate

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

Number of incidents of food borne illness associated with unsafe food handling practices

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Number of persons who increased their knowledge of the connection between food choices and risk of chronic disease.

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Number of persons who increased their knowledge of selection and preparation of foods with reduced fat and/or calories

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

Number of persons who increased knowledge of USDA serving sizes

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

Number of participants consuming appropriate USDA serving sizes

Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

Number of participants demonstrating ability to choose or prepare foods with reduced fat and/or calories

2. **Associated Institution Types**

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1000	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many Indiana workers are experiencing health problems such as heart disease, obesity, and diabetes. Heart disease is the leading cause of death for both men and women. Sixty-one percent of the residents are overweight or obese and eight percent have diabetes. Employee health issues affect absenteeism, productivity, morale and healthcare costs in the workplace.

What has been done
Purdue Extension partnered with county government officials to conduct a worksite wellness program. The overall goal of the program was to improve at-work dietary practices. Objectives included increased knowledge of personal dietary strengths and weaknesses and the relationship

between health and nutrition, decreased stress and weight if desired, and increased support of co-workers and supervisors.

Results
Twenty-five county employees participated in the program. Two-thirds reported they had a better understanding of their personal health and nutrition issues after the program. 100% reported they learned new ideas for healthy lunches and snacks. Ninety-two percent plan to read food labels to make better food choices. Forty percent have an increased knowledge of portion size and fifty percent are in the process of making healthy dietary changes.

4. Associated Knowledge Areas

KA Code	Knowledge Area
702	Requirements and Function of Nutrients and Other Food Components
703	Nutrition Education and Behavior

Outcome #13

1. Outcome Measures

Number of participants with decreased risk factors for chronic disease (including diabetes, heart disease, obesity)

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	100	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Consumption of phytochemical-rich foods has been associated with prevention of chronic disease. This project will determine the effects of food formulation and processing on absorption and potential physiological activity of dietary phytochemicals from common fruits, vegetables, and beverages.

What has been done
Researchers have continued pre-clinical and clinical evaluations of phytochemical bioavailability from grapes, green tea, cocoa, and salad vegetables. They have applied preclinical models to assess how formulation may modulate polyphenol bioavailability and metabolism from chocolate confections. They have completed a clinical trial investigating the impact of co-consumed lipid on carotenoid absorption of vegetables.

Results
This research continues to expand the knowledge of how food formulation, processing and administration may impact phytochemical bioavailability, metabolism, and tissue distribution. The research is beginning to provide evidence for the presence of bioactive polyphenol forms at target tissues. These research efforts will facilitate design and development of product formulations and dosing strategies favoring absorption of bioactive phytochemicals from foods.

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
702	Requirements and Function of Nutrients and Other Food Components

Outcome #14

1. Outcome Measures

Number of participants with decreased chronic disease complications (including diabetes, heart disease, obesity)

Not Reporting on this Outcome Measure

Outcome #15

1. Outcome Measures

Number of persons who increase knowledge of the relationship between nutrition and health

Not Reporting on this Outcome Measure

Outcome #16

1. Outcome Measures

Number of persons who increased their knowledge of physical activity recommendations

Not Reporting on this Outcome Measure

Outcome #17

1. Outcome Measures

Number of persons who adopt one or more practices to improve food choices and activity levels

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	1000	14741

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Youth establish lifelong food, nutrition, and physical activity habits during their early years.

What has been done
Exploring MyPyramid with Professor Popcorn is a curriculum for youth in grades 1-6. Lessons provide nutrition and health information and an opportunity to practice new skills. Major concepts in the curriculum have been linked to Indiana's health and science education standards. Professor Popcorn was taught in 43 Indiana counties to 26,447 youth.

Results
In end of session evaluations 78% of youth in grades 3-4 reported that they practiced one or more healthy food selection habits and 89% practiced healthy physical activity habits. Additionally, 78% of youth in grades 5-6 reported they practiced one or more healthy food selection habits at least most days of the week nad 91% reported they practiced healthy physical activity habits at least most days of the week. 84% of the 5th- 6th graders reported that they chose to eat breakfast and 63% tried new foods.

4. Associated Knowledge Areas

KA Code	Knowledge Area
701	Nutrient Composition of Food
703	Nutrition Education and Behavior

Outcome #18

1. Outcome Measures

Number of participants that report reduced medical costs because of changes in food choices and activity levels

Not Reporting on this Outcome Measure

Outcome #19

1. Outcome Measures

Number of parents who have increased their understanding of how to raise healthy eaters

Not Reporting on this Outcome Measure

Outcome #20

1. Outcome Measures

Number of people who increase their knowledge on controlling bed bugs

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	{No Data Entered}	200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Over the last decade the number of homes, apartments, and hotels that were infested with bed bugs increased rapidly. Homeowners and businesses incur costs associated with bed bug infestations due to replacement of bed bug-infested furniture and hiring pest management professionals. There is an urgent need for new research that sheds light on bed bug biology and spread, and public education about how to identify, avoid and control bed bugs.

What has been done
Educational workshops have been presented to a number of groups to increase understanding of how to identify and avoid bed bugs or how to control them if they are already present. Research designed to understand bed bug dispersal patterns in multi-unit housing is ongoing.

Results
Little is known about bed bug dispersal under field conditions and these research results underscore the need for public education, early detection, and adoption of more effective bed bug control programs.

4. Associated Knowledge Areas

KA Code	Knowledge Area
721	Insects and Other Pests Affecting Humans

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.)
- null

Brief Explanation

{No Data Entered}

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

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 10

1. Name of the Planned Program

Agricultural, Natural Resources, 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
401	Structures, Facilities, and General Purpose Farm Supplies				
402	Engineering Systems and Equipment				
403	Waste Disposal, Recycling, and Reuse				
404	Instrumentation and Control Systems				
405	Drainage and Irrigation Systems and Facilities				
	Total				

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	5.9	0.0	15.5	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	1890 Matching	1862 Matching	1890 Matching
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	1890 All Other	1862 All Other	1890 All Other
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

NO LONGER REPORTING ON THIS PLANNED PROGRAM
•Energy workshops and educational programs will be conducted throughout the state that involve key research scientists ranging from chemical engineers to logistics experts to economists. •A team of scientists including experts in animal nutrition, soil fertility, and farm management will conduct research and work with farmers to reduce water pollution, especially phosphorus •Food safety experts, along with microbiologists and nanotechnology experts, will develop sensors that will enhance food safety and risks from bioterrorism •Livestock facilities will be designed and analyzed to determine optimal nutrient management systems from an environmental and cropping systems perspective •Electro-hydraulic sensors and off-road machine operation systems will be designed and tested. •Scientists will monitor air quality of selected concentrated livestock systems on farms in multiple states to facilitate the determination of science-based EPA regulatory standards.

2. Brief description of the target audience

NO LONGER REPORTING ON THIS PLANNED PROGRAM
•Indiana livestock producers, especially those managing confined feeding operations •Crop farmers interested in applying animal wastes to enhance yields and reduce water pollution •Stakeholders in the bio-energy industry including Country Mark Cooperative, Indiana State Department of Agriculture, Indiana Soybean Alliance, Indiana Corn Growers,grain processors such as ADM, Cargill, and Tate & Lyle •Officials with federal (EPA) and state (IDEM) regulatory agencies •Off-road farm and industrial equipment manufacturers will be contacted and offered patent licensing opportunities as sensors for machine operation and maintenance are developed and tested.

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2010
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational workshops and seminars on nutrient management and air quality
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of research-based educational programs on bio-fuel production, distribution, and policy
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of websites and publications developed
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of patents applied for and licensing arrangements entered into with off-road farm and industrial equipment manufacturers
  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 of producers who increase awareness and knowledge concerning science-based methods to manage animal wastes so as to minimize potential soil and air pollution
2	Number of environmental pollution incidents caused by inappropriate application of animal wastes to soils or emission of animal odors from production facilities
3	Number of farmers who enhance soil fertility and reduce soil pollution through less reliance on commercial fertilizer and increased reliance on properly applied animal waste
4	Number of energy producers, farmers, and consumers who increase their knowledge of the technical and economic implications of increased use of Indiana produced corn and soybeans in bio-fuels
5	Number of technologies developed and disseminated that will increase the efficiency of bio-fuel production
6	Number of bushels of Indiana produced corn and soybeans used in bio-fuels
7	Number of farmers who increase their knowledge of livestock building designs that are energy efficient as well as more animal welfare friendly
8	Number of farmers who optimize livestock welfare through the design of efficient and animal sensitive farm structures.
9	Number of farmers who increase total livestock production and profitability through the adoption of building designs that are energy efficient as well as more animal welfare friendly
10	Number of livestock facilities designed to minimize odor emissions and potential air pollution
11	Number of turfgrass specialists with increased knowledge of nutrient and soil management

Outcome #1

1. **Outcome Measures**

Number of producers who increase awareness and knowledge concerning science-based methods to manage animal wastes so as to minimize potential soil and air pollution

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Number of environmental pollution incidents caused by inappropriate application of animal wastes to soils or emission of animal odors from production facilities

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Number of farmers who enhance soil fertility and reduce soil pollution through less reliance on commercial fertilizer and increased reliance on properly applied animal waste

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Number of energy producers, farmers, and consumers who increase their knowledge of the technical and economic implications of increased use of Indiana produced corn and soybeans in bio-fuels

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Number of technologies developed and disseminated that will increase the efficiency of bio-fuel production

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

Number of bushels of Indiana produced corn and soybeans used in bio-fuels

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

Number of farmers who increase their knowledge of livestock building designs that are energy efficient as well as more animal welfare friendly

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Number of farmers who optimize livestock welfare through the design of efficient and animal sensitive farm structures.

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Number of farmers who increase total livestock production and profitability through the adoption of building designs that are energy efficient as well as more animal welfare friendly

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

Number of livestock facilities designed to minimize odor emissions and potential air pollution

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

Number of turfgrass specialists with increased knowledge of nutrient and soil management

Not Reporting on this Outcome Measure

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

Brief Explanation

{No Data Entered}

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

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 11

1. Name of the Planned Program

Economics, Markets, and Policy

V(B). Program Knowledge Area(s)

1. Program Knowledge Areas and Percentage

KA Code	Knowledge Area	%1862 Extension	%1890 Extension	%1862 Research	%1890 Research
601	Economics of Agricultural Production and Farm Management				
602	Business Management, Finance, and Taxation				
603	Market Economics				
604	Marketing and Distribution Practices				
605	Natural Resource and Environmental Economics				
606	International Trade and Development				
607	Consumer Economics				
609	Economic Theory and Methods				
610	Domestic Policy Analysis				
611	Foreign Policy and Programs				
	Total				

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	22.0	0.0	18.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

NO LONGER REPORTING ON THIS PLANNED PROGRAM

•The Center for Trade Policy Analysis will conduct workshops with stakeholders on the expected economic impacts of trade and domestic agricultural policy. •The New Ventures Team and staff in the Agricultural Innovation and Commercialization Center will offer training programs throughout the state on entrepreneurship and starting new value-added businesses. •Agricultural policy workshops will be conducted with farm groups such as the Indiana Farm Bureau and the Farm Policy Study Group. •Websites such as the Agricultural Economic Reports will provide timely analysis on marketing, management, and policy issues. •Econometric and simulation models will be specified and validated to determine the socioeconomic impacts of proposed international trade and domestic agricultural policy proposals.

2. Brief description of the target audience

NO LONGER REPORTING ON THIS PLANNED PROGRAM

•Indiana farmers •State and Federal government policy makers, especially the Indiana State Department of Agriculture and the Office of the Secretary of Agriculture •Indiana general farm and commodity organizations such as Indiana Farm Bureau, Indiana Pork Producers, Indiana Soybean Alliance •Agricultural input supply industry managers such as Monsanto, DuPont-Pioneer, John Deere, Beck Hybrids, Dow-AgroSciences •Agricultural marketing firms such as Tate & Lyle, ADM, Countrymark, Cargill •International trade organizations and officials including the Office of the U.S. Special Trade Representative and WTO in Geneva

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2010
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of programs with state and federal government officials on trade and farm policy development and impact assessment
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of programs offered to food and agri-business leaders by the Center for Food and Agricultural Business
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number and quality of peer reviewed research publications in professional journals on economics, management, markets, new and small business development, and policy
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of programs with Indiana farmers on farm management and commodity marketing such as the annual Top Crop Farmer Workshop, Farm Management Tour, and the Outlook Campaign
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Number of programs offered to tax professionals, attorneys, lenders and other professionals advising farmers and small business owners
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Number of programs offered to entrepreneurs and small business owners as part of the Agricultural Innovation and Commercialization Center/New Ventures
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Number of programs on the economics of biofuels
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Number of estate planning programs offered to farm and family business owners
  Not reporting on this Output for this Annual Report

Output #9

Output Measure

- Number of risk management education programs
  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 of participants who increase their knowledge of commodity markets and marketing contracts
2	Number of Indiana farmers who increase the use of commodity markets and marketing contracts to reduce price risk and increase profitability
3	Number of Indiana farms that increase productivity and profitability
4	Number of farm and commodity organization members who increase their knowledge of the potential economic impacts of alternative farm commodity program provisions such as implications for exports, domestic utilization and price, farm income, and government farm program expenditures
5	Number of research-based studies, publications, and reports for policy organization members and legislators on the consequences of their international trade and farm commodity program choices in Farm Bill and related federal legislation
6	Number of research-based analyses of trade liberalization and market-oriented policies to guide government policy-makers as they draft appropriate legislation to increase the competitiveness of U.S. agriculture in a global market
7	Number of food and agribusiness firms, private investors, commodity organization leaders, and government officials who increase their knowledge of the economic potential to increase the number and size of new and current value-added agricultural industries such as grain and livestock processing.
8	Number of new value-added agricultural associated small businesses in Indiana
9	Number of farmers generating additional farm income from additional market opportunities for grain, livestock, and specialty crops
10	Number of participants who increase their knowledge of tax and legal issues affecting farmers and small businesses
11	Number of food and agribusiness managers who increase their knowledge of marketing and sales strategies, general business management, and making decisions under highly uncertain situations
12	Number of entrepreneurs and small businesses that improve efficiency and increase profitability
13	Number of potential entrepreneurs who avoid making bad investment decisions following analysis they did with assistance from AICC/New Ventures programs and resources

Outcome #1

1. **Outcome Measures**

Number of participants who increase their knowledge of commodity markets and marketing contracts

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Number of Indiana farmers who increase the use of commodity markets and marketing contracts to reduce price risk and increase profitability

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Number of Indiana farms that increase productivity and profitability

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Number of farm and commodity organization members who increase their knowledge of the potential economic impacts of alternative farm commodity program provisions such as implications for exports, domestic utilization and price, farm income, and government farm program expenditures

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Number of research-based studies, publications, and reports for policy organization members and legislators on the consequences of their international trade and farm commodity program choices in Farm Bill and related federal legislation

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

Number of research-based analyses of trade liberalization and market-oriented policies to guide government policy-makers as they draft appropriate legislation to increase the competitiveness of U.S. agriculture in a global market

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

Number of food and agribusiness firms, private investors, commodity organization leaders, and government officials who increase their knowledge of the economic potential to increase the number and size of new and current value-added agricultural industries such as grain and livestock processing.

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Number of new value-added agricultural associated small businesses in Indiana

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Number of farmers generating additional farm income from additional market opportunities for grain, livestock, and specialty crops

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

Number of participants who increase their knowledge of tax and legal issues affecting farmers and small businesses

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

Number of food and agribusiness managers who increase their knowledge of marketing and sales strategies, general business management, and making decisions under highly uncertain situations

Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

Number of entrepreneurs and small businesses that improve efficiency and increase profitability

Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

Number of potential entrepreneurs who avoid making bad investment decisions following analysis they did with assistance from AICC/New Ventures programs and resources

Not Reporting on this Outcome Measure

V(H). Planned Program (External Factors)

External factors which affected outcomes

- Natural Disasters (drought, weather extremes, etc.)
- Economy
- Public Policy changes
- Government Regulations
- Competing Public priorities
- Competing Programmatic Challenges
- Other (Diffusion of new technology)

Brief Explanation

{No Data Entered}

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

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Plants and Their Systems

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				
202	Plant Genetic Resources				
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants				
204	Plant Product Quality and Utility (Preharvest)				
205	Plant Management Systems				
206	Basic Plant Biology				
211	Insects, Mites, and Other Arthropods Affecting Plants				
212	Pathogens and Nematodes Affecting Plants				
213	Weeds Affecting Plants				
214	Vertebrates, Mollusks, and Other Pests Affecting Plants				
215	Biological Control of Pests Affecting Plants				
216	Integrated Pest Management Systems				
	Total				

V(C). Planned Program (Inputs)

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

Year: 2010	Extension		Research	
	1862	1890	1862	1890
Plan	34.0	0.0	49.0	0.0
Actual	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

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

Extension		Research	
Smith-Lever 3b & 3c	**1890 Extension**	**Hatch**	**Evans-Allen**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}	{NO DATA ENTERED}

V(D). Planned Program (Activity)

1. Brief description of the Activity

NO LONGER REPORTING ON THIS PLANNED PROGRAM

•Conduct meetings, conferences, and workshops •Publish newsletters and Extension publications •Develop web sites •Field days •Demonstration plots •Consultations •Applied research •Mass media •Short courses

2. Brief description of the target audience

NO LONGER REPORTING ON THIS PLANNED PROGRAM

•Agricultural crop producers •Crop consultants •Agribusinesses •Landowners •Horticultural producers •Professionals involved with golf courses, lawn care, sod production, athletic turf, and grounds •Individuals and families interested in small farms or alternative enterprises •Homeowners •Youth

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	0	0	0	0

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

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of programs offered to producers, horticultural enterprises, Master Gardeners, etc.
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of research projects.
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of research publications.
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of volunteers trained to assist with information and programs.
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Number of Extension publications written, new or revised; web sites developed
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Number of Extension publications distributed
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Number of newsletter or magazine articles written
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Number of consultations
  Not reporting on this Output for this Annual Report

Output #9

Output Measure

- Number of K-12 classroom visits
  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 of horticultural enterprises who increase knowledge of new and appropriate technologies and effective cropping practices to produce high quality products while protecting, preserving and sustaining their land and the regional environment
2	Number of horticultural enterprises who adopt new and appropriate technologies and effective cropping practices to produce high quality products while protecting, preserving and sustaining their land and the regional environment
3	Number of Indiana citizens who increase knowledge of proper landscape and garden management.
4	Number of volunteers who increase knowledge of consumer horticulture to serve as first detectors for symptoms of invasive species.
5	Number of professional turf managers who increase knowledge of pesticides, nutrients, and water inputs for maintaining high quality turf.
6	Number of professional turf managers who reduce pesticide, nutrient, and water inputs while maintaining high quality turf.
7	Number of high quality turf acres maintained with reduced pesticides, nutrient and water inputs.
8	Number of crop producers who increase knowledge of integrated pest management practices
9	Number of acres of field crops (corn, soybeans, forage, small grains) in which pests are managed using an integrated pest management system.
10	Number of crop producers who increase knowledge of best management practices in crop, nutrients, and related soil/water decisions.
11	Number of producers who adopt best management practices in crop, nutrient, and related soil/water decisions.

Outcome #1

1. **Outcome Measures**

Number of horticultural enterprises who increase knowledge of new and appropriate technologies and effective cropping practices to produce high quality products while protecting, preserving and sustaining their land and the regional environment

Not Reporting on this Outcome Measure

Outcome #2

1. **Outcome Measures**

Number of horticultural enterprises who adopt new and appropriate technologies and effective cropping practices to produce high quality products while protecting, preserving and sustaining their land and the regional environment

Not Reporting on this Outcome Measure

Outcome #3

1. **Outcome Measures**

Number of Indiana citizens who increase knowledge of proper landscape and garden management.

Not Reporting on this Outcome Measure

Outcome #4

1. **Outcome Measures**

Number of volunteers who increase knowledge of consumer horticulture to serve as first detectors for symptoms of invasive species.

Not Reporting on this Outcome Measure

Outcome #5

1. **Outcome Measures**

Number of professional turf managers who increase knowledge of pesticides, nutrients, and water inputs for maintaining high quality turf.

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

   Number of professional turf managers who reduce pesticide, nutrient, and water inputs while maintaining high quality turf.

   Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

   Number of high quality turf acres maintained with reduced pesticides, nutrient and water inputs.

   Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

   Number of crop producers who increase knowledge of integrated pest management practices

   Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

   Number of acres of field crops (corn, soybeans, forage, small grains) in which pests are managed using an integrated pest management system.

   Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

   Number of crop producers who increase knowledge of best management practices in crop, nutrients, and related soil/water decisions.

   Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

Number of producers who adopt best management practices in crop, nutrient, and related soil/water decisions.

Not Reporting on this Outcome Measure

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

{No Data Entered}

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

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 12

1. Name of the Planned Program

Animals and Their Systems

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	6%		6%	
302	Nutrient Utilization in Animals	30%		30%	
303	Genetic Improvement of Animals	7%		7%	
304	Animal Genome	13%		13%	
305	Animal Physiological Processes	3%		3%	
306	Environmental Stress in Animals	3%		3%	
307	Animal Management Systems	9%		9%	
308	Improved Animal Products (Before Harvest)	8%		8%	
311	Animal Diseases	10%		10%	
312	External Parasites and Pests of Animals	1%		1%	
313	Internal Parasites in Animals	1%		1%	
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals	1%		1%	
315	Animal Welfare/Well-Being and Protection	8%		8%	
	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
Plan	20.0	0.0	50.0	0.0
Actual	4.1	0.0	69.7	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**
493514	0	457452	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
943534	0	2437079	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
134834	0	3297781	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Foster leadership and economic development and facilitate strong partnerships and participation in state, regional, national, and international agencies, organizations, and groups. •Develop collaborative, multidisciplinary approaches that respond to short- and long-term educational needs and issues. •Encourage participation by extension specialists in:Taskforces, Review Committees, Advisory Boards, Editorial Boards, Commodity committees/boards, Invited presentations, Honors and Awards, Common Interest Groups, Professional Societies •Complete "needs assessment" for each species •Develop publications, workshops, consultations, seminars, certification programs, distance education modules, field days, and other opportunities. •Increase number of participants in life-long learning programs.

2. Brief description of the target audience

• Poultry and Livestock Producers • Farm employees • Nutritionists and consultants • Veterinarians • Small flock/herd owners •Youth • Consumers • County officials •Government Officials

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	1278	0	914	0

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

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	3	0	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of educational workshops and seminars offered to poultry and livestock producers

Year	Actual
2010	8

Output #2

Output Measure

- Number of research projects

Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of consultations

Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of Extension publications written, new or revised; websites developed

Year	Actual
2010	3

Output #5

Output Measure

- Number of K-12 classroom visits

Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Number of Extension publications distributed

Year	Actual
2010	2000

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Number of poultry and livestock producers and professionals who increase their knowledge of up-to-date information and technologies, management practices, and value-added opportunities
2	Number of poultry and livestock producers and professionals who adopt up-to-date information and technologies.
3	Number of livestock producers adopting practices to enhance sustainability of their operations.
4	Number of livestock producers expanding their operations.
5	Number of poultry and livestock producers utilizing animal welfare assessments to enhance their management systems.
6	Number of poultry and livestock producers and professionals who increased their knowledge of environmental stewardship practices and environmental regulations.
7	Number of poultry and livestock producers adopting management practices that maximize environmental stewardship.
8	Number of poultry and livestock producers and professionals developing comprehensive nutrient management plans.
9	Number of poultry and livestock producers who enhance soil fertility and reduce soil pollution through properly applied animal waste
10	Number of 4-H member Youth Quality Assurance certified
11	Number of adults Quality Assurance certified
12	Number of livestock tested for reproductive soundness
13	Number of livestock producers who increased tehir knowledge about alternative feedstuffs
14	Number of youth who gained knowledge about the livestock industry, animal feeding, and/or production

Outcome #1

1. Outcome Measures

Number of poultry and livestock producers and professionals who increase their knowledge of up-to-date information and technologies, management practices, and value-added opportunities

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Developing technologies that improve meat quality without negatively affecting producer profitability is imperative to increasing consumer demand for beef. Many factors can influence an animal's ability to produce highly marbled, tender beef. Previous studies indicate there is a need to address the effects of vitamin D in combination with other growth enhancing technologies on tenderness, the reason for the variable effect of vitamin A on marbling, and the effect of high amounts of distillers grains throughout the calf's lifetime (in utero and pre-weaning) on marbling and tenderness.

What has been done
Researchers have discovered that supplemental vitamin D enhances growth of feedlot cattle fed beta agonists but compounds problems associated with meat tenderness. They have also discovered that, compared with typical gestation diets, large amounts of distillers grains fed to cows during gestation increases calf birth weights and dystocia, as well as increases pre-weaning weight gains in progeny and decreases the number of days it takes for cows to become pregnant. Preliminary results from a recent study also indicated that pro-vitamin A carotenoids negatively affect fat deposition.

Results
As a result of presentations on this research, feedlot producers have made decisions about adding vitamin D to the diet to improve tenderness in cattle fed beta agonists. It has also impacted the decisions that cow/calf producers make about including distillers grain in gestation diets. Nutritionists have altered their recommendations for improving tenderness in cattle fed beta agonists. Purdue beef specialists have also increased the recommended lower limit of distillers grains that they suggest producers include in cow/calf diets.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals

Outcome #2

1. Outcome Measures

Number of poultry and livestock producers and professionals who adopt up-to-date information and technologies.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Indiana has experienced significant growth in animal agriculture, much of it in the form of farms classified as CAFOs. Consumers, producers, and community leaders need the ability to make well-informed decisions regarding issues that may coincide with the expansion of food animal production.

What has been done
Purdue formed the CAFO team to provide scientific information and research on different CAFO-related topics. The team has produced 20 issue papers and posted them on the Purdue CAFO

web site. The team coordinated a 'state of the research' conference attended by stakeholders from commondity groups, regulatory agencies, and local and state government. A small group of the team conducted a study of 50 CAFOs in eight Indiana counties examining owner/operator and labor characteristics, fiscal impact, land use, and environmental issues. The results were presented in a webinar to over 35 sites.

Results
Indiana residents now have a clearinghouse of information regarding CAFOs and their impact on the communities. Planning commission members have used the information in their decision making processes. State agencies regularly use and cite the information. The number of visits and downloads has proven that presenting the topic in a web-based format is very effective at disseminating information.

4. Associated Knowledge Areas

KA Code	Knowledge Area
301	Reproductive Performance of Animals
302	Nutrient Utilization in Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
307	Animal Management Systems
308	Improved Animal Products (Before Harvest)
311	Animal Diseases
312	External Parasites and Pests of Animals
313	Internal Parasites in Animals
314	Toxic Chemicals, Poisonous Plants, Naturally Occurring Toxins, and Other Hazards Affecting Animals

Outcome #3

1. Outcome Measures

Number of livestock producers adopting practices to enhance sustainability of their operations.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of livestock producers expanding their operations.

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of poultry and livestock producers utilizing animal welfare assessments to enhance their management systems.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	8	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Meeting the U.S. consumer demand for white meat and rapid weight gains of broilers have made meat-type fowl more susceptible to metabolic disorders such as leg abnormalities. Skeletal integrity problems are a major welfare issue because lameness is a source of bird discomfort. It also results in economic losses for the meat industry. Condemnations and downgrades at harvesting due to leg problems range from 1.2 to 5.6%.

What has been done
Researchers conducted a study to determine if differences in skeletal traits exist among several purebred lines of meat-type chickens and to identify genetic lines that could possibly be used in the development of progeny with improved bone mineralization. The variability of bone traits was assessed in 6 week-old male and female birds of 3 purebred commercial lines and 6 experimental purebred lines.

Results
Researchers found that differences in bone traits exist among purebred lines of meat-type chickens. The results suggest that the potential exists to genetically select birds for increased bone mineralization. This is the first study reporting bone mineralization and bone size traits for purebread lines of meat type chickens.

4. Associated Knowledge Areas

KA Code	Knowledge Area
303	Genetic Improvement of Animals
315	Animal Welfare/Well-Being and Protection

Outcome #6

1. **Outcome Measures**

Number of poultry and livestock producers and professionals who increased their knowledge of environmental stewardship practices and environmental regulations.

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

Number of poultry and livestock producers adopting management practices that maximize environmental stewardship.

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Number of poultry and livestock producers and professionals developing comprehensive nutrient management plans.

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Number of poultry and livestock producers who enhance soil fertility and reduce soil pollution through properly applied animal waste

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

Number of 4-H member Youth Quality Assurance certified

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

Number of adults Quality Assurance certified

Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

Number of livestock tested for reproductive soundness

Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

Number of livestock producers who increased tehir knowledge about alternative feedstuffs

Not Reporting on this Outcome Measure

Outcome #14

1. **Outcome Measures**

Number of youth who gained knowledge about the livestock industry, animal feeding, and/or production

Not Reporting on this Outcome Measure

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

{No Data Entered}

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

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 14

1. Name of the Planned Program

Natural Resources and 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
101	Appraisal of Soil Resources	1%		1%	
102	Soil, Plant, Water, Nutrient Relationships	18%		18%	
104	Protect Soil from Harmful Effects of Natural Elements	5%		5%	
111	Conservation and Efficient Use of Water	2%		2%	
112	Watershed Protection and Management	6%		6%	
121	Management of Range Resources	1%		1%	
123	Management and Sustainability of Forest Resources	18%		18%	
125	Agroforestry	1%		1%	
131	Alternative Uses of Land	10%		10%	
132	Weather and Climate	4%		4%	
133	Pollution Prevention and Mitigation	24%		24%	
135	Aquatic and Terrestrial Wildlife	10%		10%	
	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
Plan	12.0	0.0	32.0	0.0
Actual	1.4	0.0	6.5	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**
394550	0	14756	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
840672	0	1004402	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
121974	0	357405	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Workshops •Extension publications •Public service announcements •Research projects •Web site development •Home and farm visits •Displays •IP video programs •Demonstrations and field days •One-on-one consultations •Collaboration with other agencies

2. Brief description of the target audience

•Agricultural producers •Rural and urban residents •Elected officials and other decision-makers •Owners of private and public forestlands and wildlands •Natural resource professionals •Technical service providers •Tree care providers •Right of way managers •Urban planners •Youth

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	2450	0	1683	0

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

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	9

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of programs offered to producers, land owners, and land managers.
  Not reporting on this Output for this Annual Report

Output #2

Output Measure

- Number of research projects
  Not reporting on this Output for this Annual Report

Output #3

Output Measure

- Number of demonstrations and field days
  Not reporting on this Output for this Annual Report

Output #4

Output Measure

- Number of Extension publications written, new & revised
  Not reporting on this Output for this Annual Report

Output #5

Output Measure

- Number of publications, media interactions, and presentations related to Indiana and regional weather and climate
  Not reporting on this Output for this Annual Report

Output #6

Output Measure

- Number of K-12 Classroom visits
  Not reporting on this Output for this Annual Report

Output #7

Output Measure

- Number of one-on-one consultations
  Not reporting on this Output for this Annual Report

Output #8

Output Measure

- Number of newsletter or magazine articles written
  Not reporting on this Output for this Annual Report

Output #9

Output Measure

- Number of volunteers trained

Year	Actual
2010	172

Output #10

Output Measure

- Number of Plan Commission meetings

Year	Actual
2010	118

Output #11

Output Measure

- Number of Extension publications distributed
  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 of participants who increase knowledge of practices to protect water resources
2	Number of participants who improve decision making for use of water resources
3	Number of participants who increase knowledge of proper application of fertilizer, manure and waste products to soil and potential for environmental consequences of misapplication
4	Number of participants who increased adoption of proper application of fertilizer, manure and waste products to soil
5	Number of participants who increase knowledge of best management practices for optimal manure nutrient utilization with on- and off-site agricultural lands
6	Number of participants who adopt best management practices for optimal manure nutrient utilization with on- and off-site agricultural lands
7	Number of participants who increase knowledge of the value of ponds in landscapes and methods for installing and managing ponds
8	Number of participants who increase value of landscapes through better installation and management of ponds
9	Number of participants who increase knowledge of on-site wastewater treatment siting and maintenance needs
10	Number of participants who make more informed decisions for on-site wastewater treatment siting and maintenance
11	Number of water quality violations related to animal production and land application in the state of Indiana
12	Number of tree care providers in Indiana who become certified arborists.
13	Number of professional natural resource advisors who have the skills necessary to assess the health of the wildlands
14	Number of wildlands owners who have a relationship with knowledgeable professional natural resource advisors and have developed and implemented a management plan
15	Number of natural resource professionals and wildland owners who have worked with landowners to develop and implement management plans
16	Number of owners of wildlands who will have assessed the health of their lands and developed and implemented management plans
17	Number of observers participating in weather and climate monitoring efforts

18	Number of certified arborists maintaining their certification
19	Number of landowners with knowledge of proper tree planting and management techniques
20	Number of participants who increased their knowledge of natural resource management
21	Number of participants who increased their knowledge of proper application of pesticides
22	Number of participants who increased their knowledge of topsoil importance
23	Number of participants who increased their knowledge of Indiana's diverse wildlife
24	Number of woodlot owners who improved their management skills

Outcome #1

1. Outcome Measures

Number of participants who increase knowledge of practices to protect water resources

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Number of participants who improve decision making for use of water resources

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Watershed planning and evaluation throughout the Great Lakes region is often done in an ad hoc manner without understanding the importance of the human dimensions.

What has been done
Researchers have continued to develop and pilot test a regional system for social indicators for watershed management.

Results
Thirty watershed groups in the region are using this system. It has improved project planning so groups now understand how to develop locally appropriate education and outreach programs. Projects are also able to use the system to evaluate their effectiveness.

4. Associated Knowledge Areas

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

Outcome #3

1. Outcome Measures

Number of participants who increase knowledge of proper application of fertilizer, manure and waste products to soil and potential for environmental consequences of misapplication

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of participants who increased adoption of proper application of fertilizer, manure and waste products to soil

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of participants who increase knowledge of best management practices for optimal manure nutrient utilization with on- and off-site agricultural lands

Not Reporting on this Outcome Measure

Outcome #6

1. **Outcome Measures**

Number of participants who adopt best management practices for optimal manure nutrient utilization with on- and off-site agricultural lands

Not Reporting on this Outcome Measure

Outcome #7

1. **Outcome Measures**

Number of participants who increase knowledge of the value of ponds in landscapes and methods for installing and managing ponds

Not Reporting on this Outcome Measure

Outcome #8

1. **Outcome Measures**

Number of participants who increase value of landscapes through better installation and management of ponds

Not Reporting on this Outcome Measure

Outcome #9

1. **Outcome Measures**

Number of participants who increase knowledge of on-site wastewater treatment siting and maintenance needs

Not Reporting on this Outcome Measure

Outcome #10

1. **Outcome Measures**

Number of participants who make more informed decisions for on-site wastewater treatment siting and maintenance

Not Reporting on this Outcome Measure

Outcome #11

1. **Outcome Measures**

   Number of water quality violations related to animal production and land application in the state of Indiana

   Not Reporting on this Outcome Measure

Outcome #12

1. **Outcome Measures**

   Number of tree care providers in Indiana who become certified arborists.

   Not Reporting on this Outcome Measure

Outcome #13

1. **Outcome Measures**

   Number of professional natural resource advisors who have the skills necessary to assess the health of the wildlands

   Not Reporting on this Outcome Measure

Outcome #14

1. **Outcome Measures**

   Number of wildlands owners who have a relationship with knowledgeable professional natural resource advisors and have developed and implemented a management plan

   Not Reporting on this Outcome Measure

Outcome #15

1. **Outcome Measures**

   Number of natural resource professionals and wildland owners who have worked with landowners to develop and implement management plans

2. **Associated Institution Types**

   - 1862 Extension
   - 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	205

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Many rural landowners seek ways to earn extra income yet unfamiliarity with potential business options, concerns about profitablility, liability, marketing and resource management are barriers to beginning a business enterprise. There are a number of natural resources enterprises that can be a viable source of supplemental income for rural landowners. These enterprises are compatible with existing land uses while enhancing our natural resources.

What has been done
Purdue Extension partnered with Mississippi State University and Indiana Farm Bureau, Inc. to host four workshops that showcased outdoor recreational businesses and other income-producing enterprises. Experts provided sessions on revenue potential, liability, business planning and successful business ventures. The workshops provided prospective entrepreneurs an opportunity to learn the most important aspects of natural resource enterprises, talk with successful business owners, and interact with their local land management professionals.

Results
205 people who owned or managed a total of 25,500 acres attended the workshops. Eighty-six percent thought the workshops would help them increase revenue earned on the property. This group expected their revenue from using information learned at the workshops would increase from $22.23 to $38.84 per acre annually. Ninety-two percent indicated the information presented would help them meet wildlife goals for their property. Seventy-four percent intended to change at least one land use practice as a result of the program.

4. Associated Knowledge Areas

KA Code	Knowledge Area
121	Management of Range Resources
123	Management and Sustainability of Forest Resources
131	Alternative Uses of Land
135	Aquatic and Terrestrial Wildlife

Outcome #16

1. **Outcome Measures**

   Number of owners of wildlands who will have assessed the health of their lands and developed and implemented management plans

   Not Reporting on this Outcome Measure

Outcome #17

1. **Outcome Measures**

   Number of observers participating in weather and climate monitoring efforts

   Not Reporting on this Outcome Measure

Outcome #18

1. **Outcome Measures**

   Number of certified arborists maintaining their certification

   Not Reporting on this Outcome Measure

Outcome #19

1. **Outcome Measures**

   Number of landowners with knowledge of proper tree planting and management techniques

   Not Reporting on this Outcome Measure

Outcome #20

1. **Outcome Measures**

   Number of participants who increased their knowledge of natural resource management

2. **Associated Institution Types**

   - 1862 Extension
   - 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	10	800

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Over 2 million ash trees provide shade and oxygen and protect the water in Indiana's cities. These trees and the other 8 billion ash tress in North America are threatened by the emerald ash borer. People need to be aware of the magnitude and seriousness of the problem. Continual changes in EAB distribution and management options have caused great confusion among both professionals and the public.

What has been done
Purdue Extension has partnered with other states in the North Central region to develop a consistent, regional message about EAB and its management. This approach includes public education about how EAB affects communities and which actions can mitigate its damaging effects. Innovative methods such as a webinar-based series called EAB University, the EAB cost calculator, and interactive guides have been used along with publications, a web site and other media efforts.

Results
Over 800 arborists nationwide are using the Emerald Ash Borer cost calculator to make decisions on how to manage urban ash trees, including city foresters in major metropolitan areas from Baltimore to Minneapolis where it has been used to inform decisions on well over 2 million urban ash trees. The cost calculator is also currently being used in major Indiana cities. The calculator was featured as an essential tool for cities in a document prepared by a national task force of EAB researchers, Extension specialists, municipalities and industry representatives that was convened to conserve urban ash trees.

4. Associated Knowledge Areas

KA Code	Knowledge Area
123	Management and Sustainability of Forest Resources
125	Agroforestry
133	Pollution Prevention and Mitigation

Outcome #21

1. **Outcome Measures**

Number of participants who increased their knowledge of proper application of pesticides

Not Reporting on this Outcome Measure

Outcome #22

1. **Outcome Measures**

Number of participants who increased their knowledge of topsoil importance

Not Reporting on this Outcome Measure

Outcome #23

1. **Outcome Measures**

Number of participants who increased their knowledge of Indiana's diverse wildlife

Not Reporting on this Outcome Measure

Outcome #24

1. **Outcome Measures**

Number of woodlot owners who improved their management skills

Not Reporting on this Outcome Measure

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

{No Data Entered}

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

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}

V(A). Planned Program (Summary)

Program # 15

1. Name of the Planned Program

Economic and Community 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%		80%	
803	Sociological and Technological Change Affecting Individuals, Families, and Communities	3%		3%	
805	Community Institutions, Health, and Social Services	17%		17%	
	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
Plan	4.0	0.0	2.0	0.0
Actual	3.5	0.0	3.9	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
421376	0	14756	0
1862 Matching	**1890 Matching**	**1862 Matching**	**1890 Matching**
1013874	0	940652	0
1862 All Other	**1890 All Other**	**1862 All Other**	**1890 All Other**
119152	0	222545	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

•Workshops •Extension publications •Research projects •Website Development •IP Video Programs •One-on-One Consultation •Collaboration with other agencies

2. Brief description of the target audience

•Local elected officials •Staff and volunteers of nonprofits/NGOs •Consumers

V(E). Planned Program (Outputs)

1. Standard output measures

2010	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	68758	0	16028	0

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

Patent Applications Submitted

Year: 2010

Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2010	Extension	Research	Total
Actual	0	0	20

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

● number of workshops conducted

Year	Actual
2010	11

Output #2

Output Measure

● number of research projects

Not reporting on this Output for this Annual Report

Output #3

Output Measure

- number of publications

Year	Actual
2010	20

Output #4

Output Measure

- number of collaborations with other agencies

Not reporting on this Output for this Annual Report

Output #5

Output Measure

- number of IP-video programs

Not reporting on this Output for this Annual Report

Output #6

Output Measure

- number of one-on-one consultations

Not reporting on this Output for this Annual Report

Output #7

Output Measure

- number of web sites developed

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 of communities that increase knowledge of how to identify and address critical issues for citizens
2	Number of communities engaged in issue identification and action planning
3	Number of communities who improve their capacity to identify and address critical issues that impact the lives of its citizens
4	Number of communities increasing knowledge related to creating sustainable and competitive local economic development systems
5	Number of communities creating more sustainable and competitive local economic development systems.
6	Number of participants who are building their community leadership skills and becoming more active in community problem-solving.
7	Number of participants becoming more active in community problem-solving efforts
8	Number of small businesses developing commercialization plans

Outcome #1

1. Outcome Measures

Number of communities that increase knowledge of how to identify and address critical issues for citizens

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

Number of communities engaged in issue identification and action planning

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Number of communities who improve their capacity to identify and address critical issues that impact the lives of its citizens

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Condition Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	20	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
Local communities often need addtional funds to be able to address issues that impact the lives of the people of the community. Grant writing is one strategy that organizations can implement to raise funds for projects, resources or personnel.

What has been done
Purdue Extension developed the Beginner's Guide to Grant Writing program whic is a 16 hour grant writing educational program offered across the state. Local Educators provide follow-up

services to the workshop participants.

Results
After completing the workshop, participants feel more confident in their grant writing skills, understand how to develop a project into a proposal, and know where to find information on available funding. Participants reported over $8.0 million in funded proposals. Grants have supported building renovations, infrastructure development, school-based programs and equipment, small business funding, environmental protection projects, health and human resource projects, computer and health education projects, youth programs, and general operating dollars for organization growth and sustainability.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

Outcome #4

1. Outcome Measures

Number of communities increasing knowledge related to creating sustainable and competitive local economic development systems

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of communities creating more sustainable and competitive local economic development systems.

Not Reporting on this Outcome Measure

Outcome #6

1. Outcome Measures

Number of participants who are building their community leadership skills and becoming more active in community problem-solving.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Quantitative Target	Actual
2010	0	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)
The state has designated the Soil and Water Conservation Boards as the lead entity to address critical water and soil conservation issues at the local level. Leadership is essential to identify critical needs, build collaborative programs and seek solutions. Knowledgable, skilled and committed leaders at the local level are necessary to address important land and water issues.

What has been done
Purdue Extension partnered with the Indiana Conservation Partnership to develop the Leadership Institute for soil and water supervisors. The Leadership Institute consists of four, two-day workshops that focus on Leadership in Change,Communication,Board Development, and impacting community. Thirteen two-day workshops have been held across Indiana in the last two years. Nearly 500 people have participated in the workshops and 57 supervisors have graduated from the 32-hour course.

Results
In end of session evaluations, 100 percent of the participants said the workshop was worth their time. Ninety-six percent of the graduates said that they will do things differently as a result of having participated. Some examples include: "My thinking process has been changed through these workshops", "be more open to changing the way we do things," and "These workshops are training for supervisors which will result in more effective boards."

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development
803	Sociological and Technological Change Affecting Individuals, Families, and Communities
805	Community Institutions, Health, and Social Services

Outcome #7

1. Outcome Measures

Number of participants becoming more active in community problem-solving efforts

Not Reporting on this Outcome Measure

Outcome #8

1. Outcome Measures

Number of small businesses developing commercialization plans

2. Associated Institution Types

- 1862 Extension
- 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)
Small businesses often have excellent technical expertise for new innovations but lack business knowledge. They need assistance in how to prepare a commercialization plan that will be integral in their success in bringing the innovation to successful commercialization.

What has been done
Purdue Extension programming included on-line lectures and webinars to provide small business owners the tools to be able to develop a commercialization plan. The program participants prepared a draft of their commercialization plan. Each written plan was reviewed and feedback with specific suggestions on how to change the plan to be more effective was provided to each participant.

Results
Participating small business owners are now in a position to generate improved commercialization plans. These plans are part of the Small Business Innovation Research proposals (Phase II) that are submitted and thus the small business has an improved chance of being successful with grant funding. Stronger commercialization plans have been shown to increase the chance that new

innovations move to the point of successful commercialization.

4. Associated Knowledge Areas

KA Code	Knowledge Area
608	Community Resource Planning and Development

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

{No Data Entered}

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

Evaluation Results

{No Data Entered}

Key Items of Evaluation

{No Data Entered}