

V(A). Planned Program (Summary)

Program # 1

1. Name of the Planned Program

Global Food Security and Hunger

Reporting on this Program

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	5%		5%	
311	Animal Diseases	5%		5%	
315	Animal Welfare/Well-Being and Protection	5%		5%	
403	Waste Disposal, Recycling, and Reuse	5%		5%	
503	Quality Maintenance in Storing and Marketing Food Products	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 FTE/SYs expended this Program

Year: 2012	Extension		Research	
	1862	1890	1862	1890
Plan	30.0	0.0	92.6	0.0
Actual Paid Professional	34.9	0.0	107.0	0.0
Actual Volunteer	0.0	0.0	0.0	0.0

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

Extension		Research	
Smith-Lever 3b & 3c	1890 Extension	Hatch	Evans-Allen
3034147	0	3279400	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2580151	0	8818658	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
470505	0	1643842	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

- Conduct educational workshops
- Conduct research
- Develop Extension curricula
- Establish distance education programs and web-based programs
- One-on-one consultations
- Develop research publications and Extension publications
- Collaborate with other agencies

2. Brief description of the target audience

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

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	144915	1747552	32461	43235

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

Patent Applications Submitted

Year: 2012
 Actual: 2

Patents listed
 8191290, 4079292

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	0	264	0

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Number of Extension publications written, new or revised

Year	Actual
2012	343

Output #2

Output Measure

- Number of research publications

Year	Actual
2012	264

Output #3

Output Measure

- Number of research projects

Year	Actual
2012	337

Output #4

Output Measure

- Number of consultations

Year	Actual
2012	12804

Output #5

Output Measure

- Number of educational workshops conducted

Year	Actual
2012	1640

Output #6

Output Measure

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

Output #7

Output Measure

- Number of web page views at Kingcorn.com

Year	Actual
2012	389263

Output #8

Output Measure

- Number of newsletters/publications distributed

Year	Actual
2012	14891

Output #9

Output Measure

- Number of collaborations with other agencies

Year	Actual
2012	504

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 expanding their operations.
4	Number of livestock producers who increased their knowledge about alternative feedstuffs
5	Number of livestock tested for reproductive soundness
6	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
7	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
8	Number of farmers who optimize livestock welfare through the design of efficient and animal sensitive farm structures
9	Number of farmers who increase their knowledge of livestock building designs that are energy efficient as well as more animal welfare friendly
10	Number of participants with increased knowledge of nutrient and soil management
11	Number of participants 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
12	Number of participants 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
13	Number of crop producers who increase knowledge of integrated pest management practices
14	Number of acres of field crops (corn, soybeans, forage, small grains) in which pests are managed using an integrated pest management system.
15	Number of crop producers who increase knowledge of best management practices in crop, nutrients, and related soil/water decisions.
16	Number of producers who adopt best management practices in crop, nutrient, and related soil/water decisions.

17	Number of volunteers who increase knowledge of consumer horticulture to serve as first detectors for symptoms of invasive species.
18	Number of participants who increase their knowledge of commodity markets and marketing contracts
19	Number of producers who increase the use of commodity markets and marketing contracts to reduce price risk and increase profitability
20	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
21	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.
22	Number of farmers generating additional farm income from additional market opportunities for grain, livestock, and specialty crops
23	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
24	Number of tools and technologies that improve productivity
25	Number of research programs that can or will have an impact on understanding input systems to meet the food, fiber, feed and fuel needs of humans.
26	Number of persons and companies increasing knowledge of better grain processing practices
27	Number of farmers, producers, consultants with new knowledge for evaluating the efficiency and/or effectiveness of their operations.

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

Not Reporting on this Outcome Measure

Outcome #2

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #3

1. Outcome Measures

Number of livestock producers expanding their operations.

Not Reporting on this Outcome Measure

Outcome #4

1. Outcome Measures

Number of livestock producers who increased their knowledge about alternative feedstuffs

Not Reporting on this Outcome Measure

Outcome #5

1. Outcome Measures

Number of livestock tested for reproductive soundness

Not Reporting on this Outcome Measure

Outcome #6

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 #7

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 #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 their knowledge of livestock 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 participants with increased knowledge of nutrient and soil management

Not Reporting on this Outcome Measure

Outcome #11

1. Outcome Measures

Number of participants 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 #12

1. Outcome Measures

Number of participants 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 #13

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #14

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 #15

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 #16

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

Outcome #17

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 #18

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #19

1. Outcome Measures

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

Not Reporting on this Outcome Measure

Outcome #20

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 #21

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 #22

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 #23

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

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

With the significant popularity of farmers markets more people are wishing to produce and sell their own special products directly to consumers. In 2009, the Indiana General Assembly created a home-based vendor exemption for food entrepreneurs - House Enrolled Act (HEA) 1309 created a unique opportunity for individuals to produce products out of their home kitchens for direct sale to the public. While HEA1309 opened a door of opportunity, there are limitations in place to protect consumers from potential health risks with foodborne illness. There is a significant need to increase understanding of opportunities and limitations of HEA1309 and to increase knowledge of science behind regulations and safe/best practices for food production in the home kitchen.

What has been done

38 County and State Extension professionals collaborated on development and production of a 3-part educational series made available live via Adobe Connect Pro to Educators, current and prospective home based vendors and County and state health department officials across Indiana. There were 32 hosted viewing sites across Indiana that were attended by 347 participants (including 124 educators and state health department officials) and 108 offsite viewing participants who took part directly from their homes/offices in either live or recorded format. Program content included presentations by Extension specialists and educators as well as successful home based vendors. Each session was comprised of real time presentations which were received at each site from presenters at various locations. Educator hosts received an array of reference materials for all participants.

Results

48% of responding home-based vendors felt the program would help them make local connections needed to get questions answered about producing food in Indiana. 66% felt the

series would enable them to effectively produce safe food products while 69% felt it would help them legally sell food at farmers markets and roadside stands. Immediately after the series one participant shared, I found the section on how to sanitize your kitchen, very helpful. I never thought that just cleaning something wasn't enough that you have to bleach it to make sure that everything is sanitized as well. Six months after series, participating home based vendors reported 67% had begun or increased their sales of food products, 32% had implemented at least one new skill to increase safety of their product, and 60% had improved their learning relationship with a local health inspector. One entrepreneur reflected, I just really wish this course was required before you could participate in a farmers market. I knew I was compliant, but several around me were not.

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

Outcome #24

1. Outcome Measures

Number of tools and technologies that improve productivity

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Midwestern farmers are challenged to find cost effective feedstocks for livestock since corn prices have significantly increased due to an increased demand for them in biofuel production and the drought.

What has been done

Purdue researchers have been exploring the potential of using alternative feeds from modified corn stover and corn ethanol co-products to replace corn silage in rations fed to lactating dairy cows.

Results

Researchers discovered that by pre-blending corn distillers solubles (CDS) with corn stover allows producers to replace at least one-half of the corn silage traditionally used in diets fed to mid-lactation cows, providing an advantage over untreated stover. These findings can influence the decision making process when producers are allocating land to either corn forage (silage) production or corn grain for ethanol.

4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
302	Nutrient Utilization in Animals
601	Economics of Agricultural Production and Farm Management

Outcome #25

1. Outcome Measures

Number of research programs that can or will have an impact on understanding input systems to meet the food, fiber, feed and fuel needs of humans.

2. Associated Institution Types

- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

To meet the demand for food, fiber, feed and fuel of a growing human population, it is important to understand the input-use efficiency between various crops that serve multiple purposes (e.g. corn for food, feed, or fuel; soybean vs corn based on anticipated sales prices, etc.)

What has been done

Purdue researchers, as part of a CAP with Iowa, are comparing input use efficiency of cropping systems for food, feed and bioenergy production. Yield and efficiency of radiation, water and N fertilizer use are being quantified. Impact on water quality and greenhouse gas emissions are being measured. The data are being provided to economist and mechanistic modelers who are doing cost-benefit analysis and extending the findings from research plot to landscape scale.

Results

Early results show that low-input systems like native prairies may generate few greenhouse gasses and little N flows into surface and ground water from these plots, but yields are not sufficient to sustain human populations. Perennial grasses can have high yield and lose little N to the environment. Sorghum appears to have high yield, even in 2012 when severe drought impacted maize and soybean yield. Sorghum performed well on marginal soils, even with limited water, producing high biomass yields and may serve as an intermediate biomass cropping system between grain and stover production and the second generation cellulosic biomass systems dedicated to biomass production.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
205	Plant Management Systems
601	Economics of Agricultural Production and Farm Management

Outcome #26

1. Outcome Measures

Number of persons and companies increasing knowledge of better grain processing practices

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Over the past 35 years, Purdue Agricultural Safety Program documented over 1,400 cases of entrapment, engulfment, entanglements, or falls related to agricultural confined spaces in the U.S. About 70% resulted in fatalities. Nearly 1,000 cases involved grain storage and handling facilities. Need for evidenced based training for emergency first-responders was raised after record setting year in 2010 when 52 cases were documented and several of the incidents involved lengthy and complex rescues.

What has been done

Using a U.S. Department of Labor Susan Harwood Grant, Purdue Extension specialists developed evidence-based 8-hour training curriculum for rural emergency first-responders who were likely to respond to incidents at grain storage or handling facilities. The Developing a Curriculum (DACUM) method was used to identify minimum core competencies and build the supporting curriculum content at the Basic Awareness level. Purdue Extension specialists implemented 14 pilot 8-hour classes which were conducted and contents reviewed by Region V OSHA staff and subject matter experts. Extension specialists presented the final curriculum in 42 8-hour classes in Indiana, Ohio, Wisconsin, and Nebraska. In 2011/12, 520 first-responders received 4,160 hours of training. This project also had a grain safety interactive exhibit at 16 state, regional, and national events where 7,500 grain safety publications were distributed among 500,000 attendees.

Results

484 participants completed pilot training. There was about 12% average gain in knowledge between the pre- and post-tests. The program received national exposure in major agricultural publications including Success Farming, Progressive Farmer, and Farm Progress Publications. Project staff contributed to planning a National Symposium on Grain Safety and to proposed engineering standards on grain storage structures.

4. Associated Knowledge Areas

KA Code	Knowledge Area
503	Quality Maintenance in Storing and Marketing Food Products

Outcome #27

1. Outcome Measures

Number of farmers, producers, consultants with new knowledge for evaluating the efficiency and/or effectiveness of their operations.

2. Associated Institution Types

- 1862 Extension
- 1862 Research

3a. Outcome Type:

Change in Action Outcome Measure

3b. Quantitative Outcome

Year	Actual
2012	0

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Purdue conducted its 45th Top Farmer Crop Workshop which focused on educating farmers, producers, and consultants from across the country and Canada on their farm and agribusiness managerial skills. This multi-institutional offering, held on Purdue's campus since 1967, doubled in attendance in 2013 as more farmers and producers look for tools and systems to improve their productivity.

What has been done

Purdue partnered with the University of Illinois this year to introduce farmers to U of I's farmdoc. Farmdoc is intended to be a website at the forefront of "harnessing the power of the Internet to bring those answers right to their desktop." (http://www.farmdoc.illinois.edu/about/project_history.html), Farmers, better armed with up-to-date information can make smarter decisions in shorter time frames.

Results

More than 140 farmers (double attendance in recent years) participated in the workshop with 28 speakers representing agribusiness and academia. Quotes from attendees include "Good idea to bring China into the agenda. We need to know more about what is going on in China." "Sustaining Your Advantage really made me think."

4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
604	Marketing and Distribution Practices

V(H). Planned Program (External Factors)

External factors which affected outcomes

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

Brief Explanation

V(I). Planned Program (Evaluation Studies)

Evaluation Results

- Outcome 23 - post-survey and 6 month follow-up - Home-based vendors
- Outcome 24 - field study - alternate feeds form corn stover and corn ethanol to

replace corn silage

- Outcome 25 - cost-benefit analysis - input-use efficiency between crops
- Outcome 26 - pre posttest; formative (pilot) and summative measures - grain rescue

Key Items of Evaluation

- Outcome 23 - 67% increased sales of food products
- Outcome 24 - pre-blended corn distillers solubles with corn stovers replaced at least ½ corn silage to influence decision allocating land to corn forage or corn grain
- Outcome 25 - perennial grasses high yield and lose little N, sorghum high yield even in drought and may serve as intermediate biomass cropping system between grain and stover
- Outcome 26 - 12% increase knowledge among emergency first responders