

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

**Program # 6**

**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	8%		0%	
201	Plant Genome, Genetics, and Genetic Mechanisms	0%		10%	
202	Plant Genetic Resources	0%		3%	
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants	0%		3%	
204	Plant Product Quality and Utility (Preharvest)	0%		3%	
205	Plant Management Systems	8%		3%	
212	Pathogens and Nematodes Affecting Plants	0%		18%	
216	Integrated Pest Management Systems	9%		2%	
301	Reproductive Performance of Animals	4%		1%	
302	Nutrient Utilization in Animals	0%		15%	
303	Genetic Improvement of Animals	4%		24%	
305	Animal Physiological Processes	0%		8%	
306	Environmental Stress in Animals	9%		1%	
311	Animal Diseases	8%		5%	
401	Structures, Facilities, and General Purpose Farm Supplies	8%		0%	
403	Waste Disposal, Recycling, and Reuse	9%		0%	
405	Drainage and Irrigation Systems and Facilities	8%		0%	
601	Economics of Agricultural Production and Farm Management	8%		1%	
602	Business Management, Finance, and Taxation	9%		1%	
603	Market Economics	8%		2%	
	<b>Total</b>	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	69.0	0.0	69.3	0.0
Actual Paid Professional	25.8	0.0	35.1	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
2585197	0	5304246	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
2585197	0	5304246	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
8747827	0	42762261	0

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

**1. Brief description of the Activity**

Continue to be a leading research institution on basic and applied questions impacting to increase Iowa agricultural production capacity. Maintain and strengthen extension education programs targeting Iowa farmers that develop their skills to evaluate and adopt emerging technologies and best management practices. Hire and retain faculty and staff that are committed to the success of Iowa agriculture. Foster integrated research/extension teams to address priorities facing Iowa farmers. Support professional development of faculty and staff to ensure that they are competitive in external funding, respected by peers and producers and proud and productive colleagues. The severity of the drought during the entire growing season prompted multiple meetings, field days and consultations to provide farmers and others directly related to crop and livestock production with strategies to mitigate its economic effects on operations.

Faculty participate in the following associated multistate research committees: NC0007, NC0140, NC0205, NC213, NC1023, NC1029, NC1030, NC1034, NC1037, NC1038, NC1040, NC1168, NC1170, NC1171, NC1177, NC1183, NC1184, NC1191, NC1194, NC1195, NC1197, NE1020, NE1028, NE1034, NE1042, NRSP7, NRSP8, NRSP9, S0294, S1025, S1027, S1032, S1033, S1039, S1043, W1009, W1173, W2168, W2171, and others.

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

Agricultural producers in Iowa and the agribusinesses and agencies that interact with them. Policy makers that impact agriculture.

**3. How was eXtension used?**

**Cooperatives Community of Practice (CoP) on eXtension:** Iowa led the development of the multi-state Cooperatives CoP which successfully launched a new eXtension website in October 2010, [www.extension.org/cooperatives](http://www.extension.org/cooperatives). The site features information, news, events, and frequently asked questions about cooperative principles, business development, finance, board strategy, marketing and youth. An Ask-an-Expert tool allows information users to ask specific questions about cooperatives. New sector specific content has begun to take shape in 2011, including food cooperatives, farm supply and grain marketing cooperatives. A youth content team is working to develop exciting multi-media content to help young people learn about cooperative principals and career opportunities. The team conducted a Dot Survey of 1,034 FFA members at the National FFA Convention to help understand the needs and interests of the target audience. The Community of Practice is a collaborative effort led by Extension professionals and university professors from IA, ND, OK, TX, with support from industry partners and USDA Rural Development. The Cooperatives CoP is part of the National eXtension Initiative which 76 land grant universities contribute to.

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

**1. Standard output measures**

2012	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
<b>Actual</b>	85000	3736000	0	0

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

**Patent Applications Submitted**

Year: 2012  
 Actual: 15

### Patents listed

Use of Plant Antibodies in Fighting Pathogen Toxin-Induced Plant Diseases such as SDS in Soybean: Plant Anti-FvTox1 Antibody in Enhancing Foliar Sudden Death Syndrome Resistance in Soybean. Inventors: Bhattacharyya, Madan; Brar, Hargeet Kaur. Filed: 10/25/2011.

Mesoporous Silica Nanoparticles Suitable for Co-delivery: Methods for the Co-Delivery of Protein and DNA into Plant Cells Using Mesoporous Silica Nanoparticle. Inventors: Martin-Ortigosa, Susana; Trewyn, Brian; Valenstein, Justin; Wang, Kan. Filed: 12/06/2011.

Assay for Measuring Rootworm Resistance: Assay to Measure Rootworm Resistance to Transgenic Maize. Inventor: Gassmann, Aaron. Filed: 12/08/2011.

Novel Vegetable Protein Fractionization Process and Compositions: A Novel Process to Fractionate Soybean Protein. Inventors: Deak, Nicolas; Johnson, Lawrence. Filed: 12/09/2011. Patent #8,142,832 issued 3/27/12.

Molecular Cloning of brown-midrib2 (bm2) Gene: Molecular Cloning of brown-midrib2 (bm2) Gene. Inventors: Schnable, Patrick; Tang, Ho Man (Holly); Liu, Sanzhen; Wu (2011), Wei. Filed: 1/30/2012.

TAL Effector-Mediated DNA Modification: Transcription Activator-Like (TAL) Effector Nucleases. (1) Inventors: Zhang, Feng; Bogdanove, Adam; Voytas, Daniel. Filed: 3/22/2012.

TAL Effector-Mediated DNA Modification: Transcription Activator-Like (TAL) Effector Nucleases. (2) Inventors: Zhang, Feng; Bogdanove, Adam; Voytas, Daniel. Filed: 3/22/2012.

TAL Effector-Mediated DNA Modification: Transcription Activator-Like (TAL) Effector Nucleases. (3) Inventors: Zhang, Feng; Bogdanove, Adam; Voytas, Daniel. Filed: 3/22/2012.

Modification of Plants for FvTox1-interacting Protein Carbonic Anhydrase to Enhance Foliar SDS Disease Resistance and Improve Yield: Modification of Soybean Plants for the FvTox1-interacting Protein Carbonic Anhydrase to Enhance Foliar Sudden Death Syndrome Disease Resistance. Inventors: Bhattacharyya, Madan; Pudake, Ramesh. Filed: 4/27/2012.

miRNA396 and Growth Regulating Factors for Cyst Nematodes Tolerance in Plants: miRNA396 as a Tool to Control Cyst Nematodes. Inventors: Baum, Thomas; Hewezi, Tarek Abdel Fattah. Filed: 4/27/2012.

Arabidopsis Nonhost Resistance Gene(s) and Use thereof to Engineer Disease Resistant Plants: Identification and Application Arabidopsis Nonhost Resistance Gene(s) in Creating Disease Resistant Soybean Cultivars. Inventors: Sumit, Rishi; Bhattacharyya, Madan. Filed: 5/24/2012.

Aphicidal Toxins and Methods: Rational Design of Aphicidal Bt Toxins Using Aphid Gut Binding Peptides. Inventors: Bonning, Bryony; Liu, Sijun; Li, Huarong. Filed: 6/8/2012.

Identification of Protective Antigenic Determinants of Porcine Reproductive and Respiratory Syndrome Virus and Uses Thereof: Identification of the Protective Antigenic Determinants of the Porcine Reproductive Respiratory Syndrome Virus (PRRSV) which Account for Immunity to all Virulent Strains of the Virus. Inventors: Erdman, Matthew; Harris, Delbert (Hank). Filed: 6/26/2012. Patent #8,241,847 issued 8/14/12.

Improving Activity of Corn Gluten Meal as an Herbicide Using Dry Acid Treatment: Improving the Efficacy

of Corn Gluten Meal as an Herbicide Using Dry Acid Treatment. Inventors: Christians, Nick; Hippen, Renate. Filed: 7/20/2012.

Materials and Methods for Using an Acyl-Acyl Carrier Protein Thioesterase and Mutants and Chimeras Thereof in Fatty Acid Synthesis: The Functional Characterization of Novel Thioesterases for the Production of Functionalized Carboxylic Acids. Inventors: Nikolau, Basil; Yandeau-Nelson, Marna; Jing, Fuyuan. Filed: 7/25/2012.

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

#### Number of Peer Reviewed Publications

2012	Extension	Research	Total
Actual	21	120	0

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

##### Output Target

##### Output #1

###### Output Measure

- Number of producers and agribusiness professionals who attend face-to-face educational activities, including individual consultations.

Year	Actual
2012	58000

##### Output #2

###### Output Measure

- Number of producers and agribusiness professionals who subscribe to newsletters and access web-based resources.

Year	Actual
2012	5428000

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

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

O. No.	OUTCOME NAME
1	Number of livestock and crop producers who adopt management and production systems and practices to improve cost control and market access.
2	Number of intergenerational transfers or new farm businesses who learn strategies on how to successfully transition farming operations within their family, or understand the risks and opportunities connected to starting a farming enterprise.
3	Number of crop and livestock producers who increase their knowledge on marketing, insurance or USDA program alternatives that are consistent with the risk bearing ability of their businesses and their personal preferences for managing risk.
4	Number of producers and other entrepreneurs who increase their awareness of alternative enterprises or value retained opportunities by either attending an educational program or downloading educational materials from a website.
5	Number of clients who participate in horticulture programs on production methods, market outlets, Best Management Practices, and IPM techniques.
6	Number of producers and service providers who learn about crop production and protection strategies that focus on improving agronomic practices.
7	Number of livestock and crop producers who adopt management and production systems and practices to improve cost control and market access. (continued)
8	Number of businesses that learn technical assistance in accessing capital for economic development of new food-based business startups.
9	Number of dairy producers and agribusiness professionals who learn management and production practices to improve cost control and profitability.
10	Number of producers and service providers who learn about crop production and protection strategies that can help them manage crops and natural resources during the drought of 2012.

## **Outcome #1**

### **1. Outcome Measures**

Number of livestock and crop producers who adopt management and production systems and practices to improve cost control and market access.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Condition Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2012	1400

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

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

A. Most pork producers do not have adequate expertise or training for effectively managing their ventilation systems relative to swine well-being and comfort to provide a healthy air environment and conserve energy. A healthy air environment is important for pig performance and for the competitive position of Iowa pork producers. Both pork producers and society are impacted. Pork production is a foundation wealth generating economic engine in Iowa supporting thousands of jobs both directly and indirectly. Saving energy costs is important in the effort to reduce greenhouse gases. This program keeps energy prices affordable and reduces emissions, thus lowering the carbon footprint.

B. Agriculture production methods are an important consideration for a growing number of consumers and producers looking for alternatives to conventional agricultural production systems. Helping niche pork producers become more efficient is beneficial for both the producer and the consumer that desires a food choice. Producing pork from these types of farms is important economically for small family-oriented pork operations. Previous work with niche pork producers has shown challenges with reproduction, feed efficiency, growing piglet mortality, health issues, pre-weaning survival and nutrient management. These issues, if not addressed, will reduce income, increase carbon footprint, reduce competitive position and hinder robust local farm economic development.

C. Increased grain demand for feed and ethanol has increased economic incentives for Iowa farmers to convert marginal land from pasture or forage to crop production. According to the USDA Census of Agriculture, nearly 20% of Iowa pastureland was converted to cropland from 2002 to 2007. High grain prices in the period 2008 to 2012 have continued or accelerated this trend. Improving productivity of pastures through better management allows increased beef production per acre of land. Improved productivity in turn incentivizes marginal land to remain in forage production. Profitable forage production on marginal land improves economic activity in

rural Iowa, reduces soil erosion and improves water quality.

### **What has been done**

A. A multistate, interdisciplinary team (South Dakota, Minnesota, Nebraska and Iowa) developed a training program on ventilation system management that producers can understand and adopt into their operations. Pork producer associations in those states have seen the value of the workshop and have helped to fund the cost. A pre-test survey shows a high level of misunderstanding regarding ventilation systems and related animal husbandry practices. The workshop incorporated a hands-on method that allowed participants to learn, not only from the specialists, but also from putting the newly acquired information into practice. Specialists worked together to build a model swine facility on wheels that contains all the equipment, inlets, and controllers needed to let producers practice ventilation principles. In Iowa a huge effort was made to use this training with pork producers. Fifteen workshops were held reaching 254 pork production operations and/or systems. 189 post-workshop surveys were completed; those completing the survey had influence over 10,700,671 market hogs, representing a third of Iowa's swine industry.

B. Virtual farm tours of successful niche swine producers were developed and originally watched by 75 niche farmers. The original tours were filmed and photographed for 'anytime viewing' on the Internet to increase availability. To date, these tours have been watched more than 2300 times by niche swine producers and others interested in this subject. Swine niche management techniques have been taught at 18 regional and state-wide niche workshops, reaching 478 niche pork producers. A feeding research trial has been started on an Iowa State University research farm to analyze the growth curve of niche pigs to be used in the future for formulating more cost effective niche pig production diets.

C. During the 5-year period 2007 to 2011, over 121 pasture walks, field days or other grazing programs were conducted across Iowa. These programs were attended by more than 1100 participants. The objectives of these programs were to increase attendees' knowledge of grazing and pasture management techniques, increase adoption of practices that improve forage production efficiency and improve forage utilization to reduce total feed costs for the enterprise. As a result of these programs, staff initiated the Iowa Certified Grazier Program in 2012, targeting advanced grazing managers to pilot a new curriculum for an advanced grazing school, and grazing mentor program.

### **Results**

A. After the ventilation system workshop, survey results indicated that participants had increased their confidence to make the proper changes to their system. Impact from this program was carefully measured. First, a post-meeting evaluation was completed by 189 pork production operators. A pre-test and post-test measured knowledge gained and 75% of the respondents (n=189) indicated a major increase in knowledge. Participants also indicated the new knowledge they would most likely use in their operations, listed all the changes they planned to make because of the information presented in the workshop, and estimated the dollar value gained from improving their ventilation system management. About half of the participants estimated a value change in energy savings and improved farm air quality for their operation. The total benefit for all participants (189) was reported at \$411,600 in production improvements and energy cost savings. Out of 189 respondents, 95 indicated they would make changes. Finally, a 6-month follow-up survey was sent to a sample of the participants and returned by 22 participants. It verified that the changes planned and reported on the post-workshop survey were carried out in those operations.

B. An online survey was sent to viewers of the virtual niche farm tour. Thirty-two viewers responded with 16 pages of comments about how they used the information to improve their businesses. 95% found the virtual tour effective to highly effective. A few comments from viewers:

\* The entire virtual farm tours project was a complete success in my book - very helpful to our

farmers, staff, and interested parties in the industry.

\* All the sessions were very interesting to me and I learned something new from all of them. I think that whatever works best for you is what you need to do. I have hoop buildings and want to use them for farrowing and do away with farrowing crates.

\* While the research done and presented by the ISU staff was useful, it is also usually more accessible through bulletins or on the web. As a farmer, that makes the direct contact with other farmers who I may never meet, let alone step foot on their farms, even more important and probably more useful.

\* This was such a convenient, accessible way to gather a huge amount of information from farmers that have knowledge and experience raising hogs using some alternative practices. The slides were great visuals that enhanced what was talked about, and the ability of the attendees to ask questions and interact with the presenters made it almost like being in the same room as the presenters.

C. Surveys were mailed to 1100 participants of grazing educational programs. The 154 participants that returned surveys had attended an average of 3.25 of these educational events. The participants managed an average of 129 cattle and 235 acres. As a result of the knowledge gained, 15% of participants subdivided pastures to rotationally graze, 12% increased the number of paddocks, 9% improved pasture fertility, 15% frost seeded legumes, 13% body condition scored cows to monitor performance and 15% modified their watering system. 70% of the respondents improved beef production per acre by at least 20% and the median economic value of this programming was more than \$1,000 per operation. The impact of this program resulted in \$1.1M in added economic activity to rural communities and improved the productivity equivalent to 64,000 acres, or the forage to support more than 35,000 beef cows.

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
311	Animal Diseases
401	Structures, Facilities, and General Purpose Farm Supplies
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics

#### **Outcome #2**

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

Number of intergenerational transfers or new farm businesses who learn strategies on how to successfully transition farming operations within their family, or understand the risks and opportunities connected to starting a farming enterprise.

##### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2012	505

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

A. The number of farmers in Iowa is continually decreasing. The decrease in farm numbers impacts food production and life in rural America in general. Land values and rents are at record levels this year, making the passing of farms to the next generation exceedingly difficult. Care must be taken to ensure adequate income for both retiring and beginning farmers.

B. Access to capital and or land ownership is a huge limitation for beginning and or non-traditional farmers from entering into production agriculture and agricultural processing. Developing strategies to access capital for new start-up businesses or transferring land and farm operations from generation to generation is critical to a smooth transition between ownership.

C. Surveys indicate that more and more women are assuming farm management roles in existing operations or have become land owners through purchases, inheritance and seeking ways to better manage and sustain the profitability of these farming operations. Technical assistance, training and mentoring are critical resources in helping these new managers be successful.

#### What has been done

A. 1) A series of estate planning workshops was held throughout Iowa, designed to help people begin the process of developing an estate plan for their farms. Five case studies were used to illustrate typical situations and stimulate discussion during the program. The Ag Decision Maker served as a clearinghouse for information because it provides for longevity and continued access to resources. Half of the publications and tools were added in February 2012; the balance added in March 2012. In total, sixteen publications were posted to the Whole Farm Decisions - Transition & Estate Planning section. Total participation at the thirteen workshop sites was 395, with 349 participants completing demographics and 377 completing end-of-meeting evaluations. Participants owned land in 80 of Iowa's 99 counties, Minnesota, Nebraska, and Wisconsin. 2) In addition, a series of farm transition seminars focused on transitioning the farm from one generation to the next. Areas such as conflict resolution, goal setting and other salient activities to a successful transition were covered. 3) Finally, individual consultations were provided to help landowners ascertain their options for transitioning the farm to the next generation.

B. Five companies received direct Technical Assistance to launch or expand their agricultural businesses. This assistance came in the form of either feasibility studies or market analysis report. In conjunction with an ISU Extension Farm Management Specialist, Value-Added Ag staff helped train and prepare educational leaders to conduct 3 Annie's farm management programs fostering improved problem solving, record keeping and decision making skills for farm women with an emphasis on estate planning, retirement and succession planning.

C. In conjunction with ISU Extension Farm Management Specialist - VAA staff presented at 3 "Managing for Today and Tomorrow" workshops fostering improved problem solving, record keeping and decision making skills for farm women with an emphasis on estate planning, retirement and succession planning. Forty-five women attended one of the 3 farm transition workshops.

### **Results**

A. The estate planning workshops focused on increasing understanding of the basics of estate planning and farm succession planning. Five case studies were developed to illustrate options and expected outcomes. Aspects that required an attorney were covered. 52% of the participants reported having a better understanding of who should be a part of the estate planning team. 95% reported knowing what information they needed for visiting with their attorney. 84% said they were likely to revise their wills based on the knowledge gained. 81% reported they learned how to choose an attorney and develop an estate plan. Eighty-six percent reported finding the case studies useful to very useful. Participants considered Iowa Inheritance and Federal Estate taxes to determine where uncertainty exists regarding estate taxes. The Integrated Balance Sheet exercise helped participants explore the role of tax implications in the decision making process.

B. The technical assistance provided through feasibility studies resulted in agriculture processing businesses accessing capital to make \$32M additional investments in businesses in Iowa that support \$7.2M in new or retained payroll. Forty-five participants attended 3 farm transition workshops. Survey results from 74 attendees of Annie's workshops resulted in improved awareness and a request for additional in-depth training in estate planning (54%), 61% developed new support networks and identified new professionals to support their farm management tasks.

C. Survey results showed improved awareness and a request for additional in-depth training in the following areas: 54% - estate planning, 61% developed new support networks and identified new professionals to support their farm management tasks. Comments had common themes: 1) My very first goal is to establish regular and formal farm business meetings at a neutral location with the operators of our family farm; 2) I will initiate and implement estate planning with siblings to discuss and choose from the options that are best for us; 3) Do a balance sheet on needed income and projected expenses for the next year for the short term and do a long term one for the next five years.

## **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics

## **Outcome #3**

### **1. Outcome Measures**

Number of crop and livestock producers who increase their knowledge on marketing, insurance or USDA program alternatives that are consistent with the risk bearing ability of their businesses and their personal preferences for managing risk.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Knowledge Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2012	160

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Successful producers and business managers are constantly refining their management skill set. Resources for learning new risk management strategies are often available but not always easily accessible or appropriate for non-traditional or underserved producers and business owners.

#### What has been done

Value-Added Ag (VAA) staff assisted in the training and preparation of educational leaders that conducted 9 Annie's farm management programs in Iowa. These sessions fostered or improved problem solving, record keeping and decision-making skills for farm women. 160 participants attended one of 9 risk management program sessions held across Iowa. Each session consisted of 6 sessions for a total of 54 individual class meetings.

#### Results

Participants learned strategies that they plan to implement on their own farms. Survey results from 74 attendees of Annie's workshops resulted in improved awareness and a request for additional in-depth training in the following areas: 42% grain marketing and production costs, 24% on livestock marketing, 36% on risk management. Comments had common themes: 1) Do a balance sheet on needed income and projected expenses for the next year for the short term, and do a long term one for the next five years; 2) Plan more and regular whole farm meetings.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics

## **Outcome #4**

### **1. Outcome Measures**

Number of producers and other entrepreneurs who increase their awareness of alternative enterprises or value retained opportunities by either attending an educational program or downloading educational materials from a website.

### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### **3a. Outcome Type:**

Change in Knowledge Outcome Measure

### **3b. Quantitative Outcome**

<b>Year</b>	<b>Actual</b>
2012	3260

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

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

A. Producers and processors of agricultural products are constantly looking for ways to improve the profitability of their operations. The those cases where expanding operations is not an option, identifying ways to diversify or add value to existing enterprises is often the logical option, and one that significantly improves rural economies. Access to current reliable and relevant resources and information about such options is a critical need and one that is provided through the web tools provided by the Value-Added Ag (VAA) program at AgMRC.org.

B. Local Food production and procurement continue to be an area of great interest for both producers and consumer. One of the major obstacles limiting local food production in Iowa is limited availability due to seasonality. Producers have expressed great interest in expanding their production potential through the use of High Tunnels (HT) to extend their growing season and improve production quality and quantity.

#### **What has been done**

A. VAA staff coordinate the efforts of the USDA-funded AgMRC.org website and work with a national network of value-added specialists to provide a robust and comprehensive web-based library of value-added agriculture resources and research.

B. Staff developed two Extension publications 1) rainwater catchment, and 2) vegetable production budgets for HT. Staff also conducted 7 one-day workshops introducing HT production to growers across the state. These day long workshops reached 158 current or future growers. Four additional conference presentations focused on high tunnel production introduced 100 additional growers to the production methodology.

#### **Results**

A. The project has become a national resource for value-added production processing and research information with over 120,000 unique visits per month accessing information through downloads, subscriptions to renewable fuels newsletters, 19 publication articles, and 14 radio broadcasts. Access to this information provides the users the knowledge and awareness to help in decision-making for their agricultural enterprises.

B. A High Tunnel publication has been downloaded more than 150 times; 86 growers attended workshops on the topic. These attendees provided feedback and requests for additional training on crop specific production methodology. Portions of these workshops were also presented as breakout sessions at numerous local foods workshops across the state. Survey results show that as a result of these workshops 60% of attendees plan to increase their fruit and vegetable production and marketing.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
205	Plant Management Systems
306	Environmental Stress in Animals
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics

#### Outcome #5

##### 1. Outcome Measures

Number of clients who participate in horticulture programs on production methods, market outlets, Best Management Practices, and IPM techniques.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2012	25542

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

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

Citizens of Iowa, farmers and agribusiness professionals benefit from Iowa State University certifying applicators to ensure responsible storage, handling, transport and application of pesticides across Iowa to maintain safe environmental conditions and ensure runoff from

cultivated fields does not impair water quality.

#### **What has been done**

A total of 15,757 private applicators and 9,785 commercial applicators were trained and certified on pesticide safety topics. Commercial topics included effects of pesticides on groundwater and other non-target sites; phytotoxicity; equipment calibration, safe application techniques and drift; pesticide labels; pesticide stewardship; and integrated pest management. Private topics included a technology update, exploring labels, EPA new container/containment rule, Goss's Wilt & Northern Corn Leaf Blight, Palmer Amaranth and other pigweeds, herbicide-resistant weeds, and a corn rootworm resistance management seminar.

#### **Results**

As a result of certification training, 15,757 private applicators are storing, handling, transporting and applying pesticides in a safe manner, which benefits the citizens of Iowa and the environment. Also, 9,785 commercial applicators are practicing similar safety techniques. Certification directly results in jobs retained or created, so 9,785 commercial applicators were able to obtain jobs or continue working at their current pesticide application jobs. At an average salary of \$45,000 per year, this equates to new and retained employment worth \$440 million, a tremendous economic benefit to Iowa. Specific survey results of the programs are included in the Evaluation section.

#### **4. Associated Knowledge Areas**

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
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
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics

#### **Outcome #6**

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

Number of producers and service providers who learn about crop production and protection strategies that focus on improving agronomic practices.

##### **2. Associated Institution Types**

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2012	2049

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Farmers need and seek unbiased information on crop production and consider Iowa State University Extension the primary source of such information. Research-based results helps producers and agribusiness professionals make timely and economic management decisions.

#### What has been done

Meetings are effective ways for Extension to present timely crop production research results farmers and agribusiness professionals can apply to their operations. The Crop Advantage Series (CAS) is an example of the over 300 total meetings Iowa State University has led or participated in by providing expertise. Attendance at the Crop Advantage Series was 2049 in 2012. Information delivered at the Crop Advantage Series reaches attendees who represent an estimated 23 percent of Iowa's 24.8 million acres of farmland.

#### Results

On average, CAS attendees thought the information presented in the program would improve profits by \$8.56 per acre, an average value per attendee of more than \$24,000 and a total value of over more than \$49 million.

- \* 91% of attendees indicated that the ISU information/training enabled them to better identify Goss's Wilt.
- \* 60% planned on rotating problem fields to a different crop based on ISU information/recommendations.
- \* 66% selected Goss's Wilt resistant hybrids to plant in high risk fields based on ISU information.
- \* 29% have diversified overall weed management strategies to reduce the risk of weed resistance.
- \* 29% have diversified herbicide modes of action to reduce the risk of weed resistance.
- \* 29% have agreed to reevaluate their weed management programs to reduce the risk of weed resistance.
- \* Only 1% didn't recognize that resistance was a potential risk to their farm.
- \* 93% agreed with ISU's recommendations that weed management is a long term investment rather than a short term program and cost.

Farmers benefited by implementing these recommendations through reduced risk, reduced input costs and increased production. The citizens of Iowa benefited by a reduction in pesticide

applications to the environment and increased farm profitability which builds the economic activity of the state.

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
102	Soil, Plant, Water, Nutrient Relationships
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
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems
403	Waste Disposal, Recycling, and Reuse
405	Drainage and Irrigation Systems and Facilities
601	Economics of Agricultural Production and Farm Management

#### Outcome #7

##### 1. Outcome Measures

Number of livestock and crop producers who adopt management and production systems and practices to improve cost control and market access. (continued)

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Condition Outcome Measure

##### 3b. Quantitative Outcome

<b>Year</b>	<b>Actual</b>
2012	2870

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

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

D. Beef cow numbers in the U.S. are at the lowest since the 1950s. This is occurring at a time when demand for beef exports is increasing and sustained profitability is returning the cow-calf sector. Delayed by a national drought, the rebuilding of the beef herd in Iowa appeared to be initiated in January 2012, as evidenced by an increase in beef heifer retention of 20,000 head.

Due to the reproductive biology of beef cows, the rebuilding of beef numbers could be a 4-5 year process or more. Successful implementation of technologies such as estrus synchronization, artificial insemination and ultrasound pregnancy examination can improve reproductive success and lifetime productivity of beef heifers while controlling the costs of developing these heifers.

E. Land costs continue to increase substantially. Land values increased 64% and land rents increased 37% over the past 3 years. Such increases add to uncertainty and they make entry into and/or expansion in agriculture production extremely difficult. How farmers control these costs will determine their profitability.

F. Many dairy producers (>40% in Iowa) are milking in stall barns or antiquated milking parlors which are achieving only 25 cows milked per person per hour. This not only creates a labor and financial drain, but also impacts human health and performance. In comparison, other producers are achieving 75 cows milked per person per hour in well-designed (efficiency and ergonomically) milking parlors (low cost parlors and automatic milking systems). This difference represents a person being three times more efficient in terms of labor which translates into significant differences in farm profitability between these milking systems. An exceptionally useful tool for producers contemplating milking system decisions would be a database of costs, benefits, and economic ranges of income and expense variables and responses by producers who have already implemented decisions on building low cost parlors or automatic milking systems.

#### **What has been done**

D. The Iowa Beef Center of ISUEO and the Iowa Cattlemen's Association hosted 10 Heifer Development Clinics across Iowa in January, February and March of 2012. These clinics brought information on the latest technologies in beef reproduction, genetics and nutrition to beef producers across Iowa. Reproductive technologies featured include estrus synchronization and fixed time artificial insemination, meeting nutritional needs, artificial insemination and semen handling, and use of ultrasound for early detection (<30 days) of pregnancy. Local veterinarians demonstrated ultrasound pregnancy detection in the clinics. Breeding company representatives discussed proper frozen semen handling.

E. Extension Farm Management has addressed the increasing land costs from several perspectives. A series of leasing meetings were held throughout Iowa; a major conference held for professional farm managers and land appraisers; 3 statewide surveys were conducted on land values, land ownership and cash rental rates.

F. ISUEO Dairy Team initiated, completed, and summarized surveys in 2012 of producers they had worked with who had already installed a low cost parlor (LCP) or automatic milking system (AMS) on their farm. Surveys were completed by 90% of LCP (18/20 surveyed) and 8 AMS (represents 50% of all AMS farms since this is a very recent technology) producers. Summarized data have been published in extension publications and disseminated state and nationwide through extension networks, and published in national dairy magazines.

#### **Results**

D. Participants that completed an after-meeting evaluation managed an average of 103 cows and retained 20 heifers each year. Over 90% of the attendees had improved understanding of technologies available to develop heifers, management practices to improve conception and longevity and keys to successful heifer development. More than 95% of attendees indicated that they intended to implement body condition scoring, target weight nutrition, use of estimated progeny differences for sire selection and establishment of a written health protocol. More than 80% plan to use estrus synchronization and ultrasound pregnancy diagnosis. The majority of attendees plan to retain heifers in the future and over 20% plan to increase the number retained. At the time of the series, attendees managed over 61,800 cows and retained 12,000 heifers each year.

E. 61 of 265 attendees at the Soil Management and Land Valuation Conference reported over a \$1,000 benefit to their businesses from attending the conference. This is the longest running

conference at Iowa State University. Evaluations of the leasing meetings were reported last year. The cash rent and land value surveys are the most frequently downloaded surveys. F. Herds that built a LCP on average are milking 55% more cows while decreasing milking labor 28% (2.44 hrs/day). LCP milking labor costs decreased from \$1.83/cwt milk to \$0.95/cwt (0.98/cow/day to \$0.50/day) Herds building a LCP also saw a 32% and 17% decrease in manure handling and feeding labor, respectively mainly associated with housing changes accompanying the LCP installation. LCP producers saw a 15% increase in milk production (8 lbs), 23% decrease in SCC (improved milk quality), and a 4% reduction in culling rate, equating to >\$80,000 income increase/year. 100% of LCP producers agreed the system improved cash flow, profitability, and was a good personal and financial investment. 100 % of LCP producers stated improved quality of life (valued at \$23,818/year). Herds that built an AMS are milking 12% more cows while decreasing milking labor 75%. AMS milking labor costs decreased from \$1.93/cwt milk to \$0.35/cwt (\$1.34/cow/day to \$0.27/day). AMS producers decreased heat detection labor 70% (used automatic activity monitoring), spent 40 minutes more/day on records evaluation, and 40 minutes/day less on employee oversight. AMS producers saw a 12% increase in milk production (9 lbs), 36% decrease in SCC (improved milk quality), 6% improvement in pregnancy rate, and a 1% reduction in culling rate, equating to >\$150,000 income increase/year. 100% of AMS producers agreed the system improved cash flow, profitability, and was a good personal and financial investment. 100% of AMS producers stated improved quality of life (valued at \$22,500/year). These surveys databases provide an excellent tool for current producers to evaluate costs, benefits, risks, and variability when contemplating these milking systems

#### 4. Associated Knowledge Areas

<b>KA Code</b>	<b>Knowledge Area</b>
301	Reproductive Performance of Animals
303	Genetic Improvement of Animals
305	Animal Physiological Processes
306	Environmental Stress in Animals
311	Animal Diseases
401	Structures, Facilities, and General Purpose Farm Supplies
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics

#### Outcome #8

##### 1. Outcome Measures

Number of businesses that learn technical assistance in accessing capital for economic development of new food-based business startups.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2012	5

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Ignorance of and access to capital and or land ownership is a huge limitation for beginning and/or non-traditional farmers entering into production agriculture and agricultural processing. Developing strategies to access capital for new start-up businesses or transferring land and farm operations from generation to generation is critical for a smooth transition between ownership.

#### What has been done

Five companies received direct technical assistance to launch or expand their agricultural businesses. This assistance came in the form of either feasibility studies or market analysis reports.

#### Results

The technical assistance provided these companies via feasibility studies resulted in agriculture processing businesses accessing capital to make \$32M additional investments in businesses in Iowa that support \$7.2M in new or retained payroll.

### 4. Associated Knowledge Areas

KA Code	Knowledge Area
601	Economics of Agricultural Production and Farm Management
602	Business Management, Finance, and Taxation
603	Market Economics

### Outcome #9

#### 1. Outcome Measures

Number of dairy producers and agribusiness professionals who learn management and production practices to improve cost control and profitability.

#### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

### 3a. Outcome Type:

Change in Action Outcome Measure

### 3b. Quantitative Outcome

Year	Actual
2012	258

### 3c. Qualitative Outcome or Impact Statement

#### Issue (Who cares and Why)

Dairy producers and their associated agribusiness consultants are constantly evaluating management practices and strategies, as well as new technologies and their effects on increasing dairy profitability and sustainability. They are very interested in a trusted, non-biased source of information as well as tools to better help them evaluate strategies and make and implement cost effective decisions and changes.

#### What has been done

ISUEO Dairy Team conducted a series of 7 regional dairy days (NE and SE Iowa) that focused on 6 different major areas and technologies that affect dairy profitability. Workshops included presentations and hands-on demonstrations, and a survey was conducted to assess participant understanding and knowledge gain (1-10 scoring of knowledge level with 10 being highest).

#### Results

- \* 258 participants (223 dairy producers (14% of total Iowa dairy industry) and 35 agribusiness) engaged in the program and 124 post workshop surveys were completed.
- \* 100% responded the meeting had high educational value.
- \* 40% of participants put an educational economic value on the program (~\$300 per person).
- \* Cover crop presentation resulted in a 2.54 increased knowledge score or 57% knowledge increase.
- \* Calf housing presentation resulted in a 2.58 increased knowledge score or 53% knowledge increase.
- \* Dairy economic outlook presentation resulted in a 2.50 increased knowledge score or 67% knowledge increase.
- \* Automatic milking systems presentation resulted in a 3.34 increased knowledge score or 94% knowledge increase.
- \* Dairy/beef quality assurance presentation resulted in a 2.40 increased knowledge score or 54% knowledge increase.
- \* Precision feeding presentation resulted in a 2.63 increased knowledge score or 55% knowledge increase.
- \* Five producers reported making changes based on previous dairy day with an average value of \$9,020 in increased profitability.
- \* Dairy Days improved decision making capabilities and profitability of participants.

#### 4. Associated Knowledge Areas

KA Code	Knowledge Area
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
305	Animal Physiological Processes
401	Structures, Facilities, and General Purpose Farm Supplies
601	Economics of Agricultural Production and Farm Management

#### Outcome #10

##### 1. Outcome Measures

Number of producers and service providers who learn about crop production and protection strategies that can help them manage crops and natural resources during the drought of 2012.

##### 2. Associated Institution Types

- 1862 Extension
- 1862 Research

##### 3a. Outcome Type:

Change in Action Outcome Measure

##### 3b. Quantitative Outcome

Year	Actual
2012	490179

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

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

Crop production and protection is always subject to a wide variety of variables. Changes in weather patterns rapidly impact the choice of crops grown, rotations, management timing, and pests encountered. Growers, agribusiness professionals and extension specialists must be ready to address issues that arise from these rapid changes in a timely manner to avoid adverse economic situations. The drought of 2012 was a perfect example of Extension's ability to accurately assess the situation and proactively provide information, research results and resources for farmers and service providers to help manage their operations in the face of an extreme weather disaster.

###### **What has been done**

Two rapid response drought webinars are an example of taking expert information to a statewide audience through live, interactive web meetings and also offer the option of viewing the archived meetings at their own convenience. In addition, dozens of live regional drought meetings were held in cooperation with industry partners, with thousands of farmers attending. ISU specialists also reached hundreds of thousands of clients through print and web based agricultural media,

providing agronomic information to help make integrated crop management decisions for coping with the drought.

### Results

ANR Extension specialists at Iowa State University conducted a drought educational webinar on August 21 that was hosted at 51 sites across Iowa. Participants (N = 179) were asked to evaluate the sessions and to identify information helpful to their farming operations that were impacted by the drought. There was a significant increase in participants' knowledge about grain quality concerns, feed implications, harvest considerations, fall fertility decisions, tillage, cover crops and residue as a result of attending these webinars (0.05 level of significance). In addition, participants in the drought webinar reported having 'low to some' knowledge on these topics before attending the webinar, which increased to 'some to high'. A majority of participants (70%) were 'somewhat to very likely' to talk to their grain buyers before harvest to understand the aflatoxin policy. More than 70% of respondents indicated that they plan to check and clean engine compartments more frequently, conduct soil tests and adjust rates before applying fertilizer. However, 55% indicated that they 'would not or not likely' to plant cover crops to conserve soil moisture. Also, 32% indicated that they would not test for nitrates in their silage before feeding their livestock. Participants were mixed in their perceptions on the economic impact of drought webinars on their farm operation as evidenced by the absence of any particular trend in the responses. Fifteen per cent indicated a likely economic impact from the knowledge they gained during the webinars of over \$50,000, followed by \$10,001-25,000 (11%), \$501-1,000 (10%), \$1,001-5,000 (10%), \$5,001-10,000 (10%) and \$25,001-50,000 (9%). Around 20% indicated that the information would affect 0-500 animals or acres, and a further 20% indicated it would affect more than 10,000 animals or acres. Participants identified teaching tools such as webinars (32%) and emails (32%) as most useful in receiving drought related farming information. They identified sessions focused on fall applied nitrogen (31%), soil testing (27%) and financial management (25%) as future topics of interest. A total of 127 participants completed the evaluations (response rate 71%). The majority of participants were farmers (60%), followed by land owners (24%), and agribusinesses (23%).

A Wallaces' Farmer article on fertility management post drought/planning for 2013 crop reached 50,000 web readers and 50,000 hard copy readers. A Corn/Soybean Digest article on soil management/conservation following the drought reached 250,000 readers. The Iowa Farmer Today blog entries on drought issues, including green stem syndrome in soybean, post-drought soil management, hybrid selections based on drought dynamics, pest management under drought conditions, fertility impacts of the drought and many other agronomic issues reached 90,000 print subscribers and 50,000 web readers. Harvest/fire management/prevention information was shared on regional radio, local papers, the Wallaces' Farmer website, Iowa Farmer Today web and print, reaching well over 100,000 clients.

## 4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
203	Plant Biological Efficiency and Abiotic Stresses Affecting Plants
204	Plant Product Quality and Utility (Preharvest)
205	Plant Management Systems
212	Pathogens and Nematodes Affecting Plants
216	Integrated Pest Management Systems

601 Economics of Agricultural Production and Farm Management

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

#### External factors which affected outcomes

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

#### Brief Explanation

Swine field specialists and the Iowa Pork Industry Center (IPIIC) faculty made significant efforts to address swine producer economic sustainability and business planning, which has been extremely difficult for pork producers because of consequences resulting from a severe drought in 2012. Fuel costs and a competitive environment for corn by competing industries including ethanol use, drove up feed costs to a level where most swine producers have been forced into a negative cash flow. Some producers have also faced water supply shortages and rural water issues. Extension organized a series of meetings around Iowa to discuss possible interventions to improve cash flow, adoption of more efficient production practices, downsizing herds, reducing feed wastage, aggressive culling practices, and improving health.

A new farm bill was not passed. This meant that new material was not available to develop and/or present. Extension specialists discussed options being considered by Congress, but this proved to be a fruitless endeavor after it became apparent that it would be difficult to pass a new farm bill.

The 2012 drought meant an increase in the number of crop insurance meetings but at the time it wasn't possible to change the decision whether or not to buy insurance or which level would be most profitable. This will change for the coming year and risk management will become a more important feature of ISU Extension programming.

### V(I). Planned Program (Evaluation Studies)

#### Evaluation Results

It has been difficult to evaluate the results of the drought aftermath efforts Extension educational programs provided pork producers. Many of the suggested interventions are not ideal for producers and do not return them to profitability. Farmers are generally optimistic about the future and often don't adopt best practices until it is late in the game. A third drought year will certainly drive feed costs significantly higher and fuel costs are expected to escalate in 2013 due to additional loss of refineries. Further, the continued drought severity may lead to water shortages and possibly widespread liquidation if it continues through the next crop cycle. Water tables are extremely low now and a further loss could be a state disaster.

**Private Pesticide Applicator Training Program:** A post-training survey indicated the program was well received and valuable to the participants. Overall, 96% of respondents

rated the program as good-excellent; 96% agreed that the information presented was useful for their farm operations. To determine if the program had an impact on the participants and their work methods, the evaluation examined specific areas to assess behavioral changes towards safer pesticide use practices. As a result of training, 22% of participants said they would read pesticide labels carefully every time they used them (76% reported they already did this); 54% of applicators now know the difference between Mandatory and Advisory statements on pesticide labels (46% reported they knew this prior to training). The post-training evaluation also examined if participants had indeed successfully implemented new pesticide safety activities, as a result of the previous year of P-PAT. According to the respondents, 90% said they review atrazine and other pesticide labels for precautions to prevent water contamination and 95% reported they know the characteristics of the watershed where they farm. In addition, 95% said they monitor crop growth stage and review pesticide label timing restrictions before making applications.

**Commercial Pesticide Applicator Training:** A combination of statewide programming and live presentations were used to deliver pesticide safety information to commercial applicators. Evaluations completed by the attendees were used to measure the programs' effectiveness and get feedback as to the usefulness of the information. A few examples of changes in knowledge and actions from three of the programs follow: 1) There was a significant improvement in applicators' post-training knowledge on protecting groundwater and other non-target sites, phytotoxicity, pesticide stewardship, and pest management compared to pre-training knowledge. The number of applicators who indicated they had a high level of knowledge about movement of water soluble materials in a watershed was 49% pre-training; 90% post-training. Evaluations from the Seed Treatment program indicated that after attending the program, 34% of respondents said they would purchase or put together a pesticide spill kit (65% said they already had one). Responses indicated that 24% of applicators would now help protect water supplies by inspecting check valves annually (68% said they already did this). Another example of changed behavior as a result of the training was evident in evaluations from the Ornamental and Turfgrass program. When asked if they would modify their application practices based on water quality concerns in Iowa, 42% said Yes as a result of training (52% said they already did this). In addition, 43% reported they will now check pesticide labels for phytotoxicity and sensitive plant statements as a result of training (55% reported they already did this).

## Key Items of Evaluation

Drought concerns Extension will have to address with pork producers:

- Water supply issues - will need to plan for and, if necessary, implement water delivery to swine producers. This is beyond the scope of the Iowa Pork Industry Center resources but we are prepared to assist. Iowa is in the planning stage now.
- Iowa Pork Industry Center will continue to host producer meetings across Iowa, discussing exit strategies, more efficient use of labor, and other cost saving methodologies.
- Alternative feed ingredients will be explored.
- Assist in the development of exit strategies for select producers.

An example of the tremendous impact of the swine ventilation training is evident from one participant's follow-up: he called Extension to admit his energy bill (even with a slight increase in his energy costs) was \$10,000 lower the year following the workshop after he implemented recommended practices. This program produced significant changes in a healthier air environment for workers and pigs and improved profitability through reduced energy costs.

A new farm bill will result in an increased need for providing farmers and landowners with technical information. This will be especially important if the features in a new bill change drastically. Risk management will be an important component for discussion. Currently it appears the drought may continue. This means short term planning will be important, but longer term planning to prepare for radical swings in weather will also be important for profitability.