

V(A). Planned Program (Summary)

Program # 3

1. Name of the Planned Program

Integrated Crop Management Systems - 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	15%			
104	Protect Soil from Harmful Effects of Natural Elements	10%			
205	Plant Management Systems	40%			
216	Integrated Pest Management Systems	25%			
405	Drainage and Irrigation Systems and Facilities	5%			
512	Quality Maintenance in Storing and Marketing Non-Food Products	5%			
	Total	100%			

V(C). Planned Program (Inputs)

1. Actual amount of FTE/SYs expended this Program

Year: 2014	Extension		Research	
	1862	1890	1862	1890
Plan	21.0	0.0	0.0	0.0
Actual Paid	21.0	0.0	0.0	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
843171	0	0	0
1862 Matching	1890 Matching	1862 Matching	1890 Matching
772170	0	0	0
1862 All Other	1890 All Other	1862 All Other	1890 All Other
0	0	0	0

V(D). Planned Program (Activity)

1. Brief description of the Activity

Campus-based and region-based faculty members will conduct several regional workshops and short courses in partnership with commodity groups and private industry. Venues include commodity district meetings, soil and crop conferences, regional short courses, field days, and on-line and demonstration projects.

2. Brief description of the target audience

The primary target audiences are crop producers and their advisers and private and commercial pesticide applicators. Programs will be developed for crop producers with a diversity of farm sizes, crops produced, and land resource bases. Crop advisers and service providers are important targets because of their extensive contact with crop and livestock producers, which makes them ideal intermediates in passing on University of Missouri Extension programming to a wider range of producers than could be reached by extension personnel alone. Because the future of Missouri agriculture depends on young professionals replacing retiring farmers and personnel, youth organizations such as FFA, 4-H, Young Farmers, and their teachers will receive specially designed programs.

3. How was eXtension used?

eXtension was not used in this program

V(E). Planned Program (Outputs)

1. Standard output measures

2014	Direct Contacts Adults	Indirect Contacts Adults	Direct Contacts Youth	Indirect Contacts Youth
Actual	23000	500000	6500	50000

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

Year: 2014
Actual: 0

Patents listed

3. Publications (Standard General Output Measure)

Number of Peer Reviewed Publications

2014	Extension	Research	Total
Actual	8	40	48

V(F). State Defined Outputs

Output Target

Output #1

Output Measure

- Provide in-service training session(s) for regional Extension specialists on an annual basis.

Year	Actual
2014	3

Output #2

Output Measure

- Develop or revise guide sheets annually for regional Extension specialists to use in producer meetings.

Year	Actual
2014	9

Output #3

Output Measure

- Develop or revise manuals on an annual basis for regional Extension specialists to use in producer meetings.

Year	Actual
2014	4

Output #4

Output Measure

- Print and electronic newsletters devoted to pest and crop management will be developed and distributed to regional specialists and other clientele.

Year	Actual
2014	32

V(G). State Defined Outcomes

V. State Defined Outcomes Table of Content

O. No.	OUTCOME NAME
1	Producers and crop advisors improve their knowledge related to crop management practices and systems such as new cultivars, pest control, IPM, irrigation and new practices.
2	Two thousand (2,000) private pesticide applicators will meet the legal need of certification by improving their knowledge of pesticides and their use.

Outcome #1

1. Outcome Measures

Producers and crop advisors improve their knowledge related to crop management practices and systems such as new cultivars, pest control, IPM, irrigation and new practices.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	6845

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Income from crops represents more than 50% of all agricultural receipts in Missouri. As seen by recent food riots in other parts of the globe, net gains in crop productivity in the U.S. are essential for continued economic development. In addition, use of traditional food crops for biofuel production places additional demands on cropping systems. Our goal is to prevent hungry people worldwide by developing and promoting efficient crop management systems in Missouri.

What has been done

Through a series of conferences, workshops, and meetings (more than 100 events statewide) we continue to train producers and advisors on efficient, responsible, and profitable crop production. Specific topics included fertilizer management, energy savings, disease management, herbicide injury, biofuels, resistant pests, pasture allocation, marketing, row-crop management practices, and weather information.

Results

The 200 crop advisors who attended the 2014 Crop Management Conference influence decisions on more than 9.5 million acres and will have an impact on production efficiency, economic development and environmental quality. The 6,000+ producers who attended regional events grow more than 14.9 million acres of corn, soybean, and pasture. Across all programs, attendees trust our educational content more than what they get from any other source. Many positive comments were returned on written evaluation forms pertaining to the use of audience response systems, interactive presentations, and hands-on demonstrations.

4. Associated Knowledge Areas

KA Code	Knowledge Area
102	Soil, Plant, Water, Nutrient Relationships
104	Protect Soil from Harmful Effects of Natural Elements
205	Plant Management Systems
405	Drainage and Irrigation Systems and Facilities
512	Quality Maintenance in Storing and Marketing Non-Food Products

Outcome #2

1. Outcome Measures

Two thousand (2,000) private pesticide applicators will meet the legal need of certification by improving their knowledge of pesticides and their use.

2. Associated Institution Types

- 1862 Extension

3a. Outcome Type:

Change in Knowledge Outcome Measure

3b. Quantitative Outcome

Year	Actual
2014	5200

3c. Qualitative Outcome or Impact Statement

Issue (Who cares and Why)

Pesticide applicator training helps reduce the harmful effects of improper pesticide use. The University of Missouri Extension Pesticide Applicator Training Program provides educational outreach for individuals who wish to become licensed pesticide applicators. Licensed applicators must pass an exam and participate in continuing education courses on environmentally sound uses of pesticides.

What has been done

The University of Missouri Extension Pesticide Applicator Training Program provides educational outreach for individuals who wish to become licensed pesticide applicators. Licensed applicators must pass an exam and participate in continuing education courses on environmentally sound uses of pesticides.

Results

In 2014, the University of Missouri Pesticide Applicator Training Program provided more than 75 initial certification training or recertification training sessions for a total of 1,800 commercial pesticide applicators and approximately 3,450 private pesticide applicators. Commercial

applicator training was delivered by a cadre of University of Missouri State Extension specialists with assistance of personnel from the Missouri departments of Agriculture, Conservation, Natural Resources, and Public Health. Private pesticide applicator training was delivered by either formal training sessions presented by 23 University of Missouri regional extension specialists or by applicators viewing a 2 hour and 15 minute training DVD at county extension centers. Clientele evaluations for the commercial training found 98% of those responding gave the program an excellent or good rating. Many comments were received and found the training program to be more focused, more relevant, or more enjoyable to those who attended in the past. Certified commercial applicators are required to recertify every three years; private applicators every 5 years.

4. Associated Knowledge Areas

KA Code	Knowledge Area
216	Integrated Pest Management Systems

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 Programmatic Challenges

Brief Explanation

Weather and market prices often limit crop/pasture profitability. MU Extension is a sought-after resource for answers to this, and many other questions.

V(I). Planned Program (Evaluation Studies)

Evaluation Results

MU Extension faculty members conducted more than 528 educational programs this past year in partnership with local, state and federal agencies, commodity groups and private industry. Venues included commodity district meetings, soil and crop conferences, regional short courses, field days, on-line and demonstration projects. Not all of these programs conducted in-depth evaluations but an example of some of the outcomes resulting from these programs showed that a total of 2,176 commercial applicators received training through the University of Missouri Commercial Pesticide Applicator Training Program (CPAT). In order to retain a commercial pesticide applicator license, either recertification training or retesting is required. According to the US Bureau of Labor Statistics, the mean annual salary for pesticide workers is \$32,690. The estimated economic impact of these commercial pesticide applicators receiving recertification training to retain their applicator license and thus their job through the Missouri's CPAT program is valued at \$1,720,960.

Key Items of Evaluation

Based on data from the US Farm & Ranch Survey, when compared to the US population at large, Missourians tend to more frequently contact extension for assistance with irrigation questions. Survey results indicated that in 2003 and 2008, MO irrigators contacted extension regarding irrigation 11.4% and 38.4% more than did the whole of the US population. The popularity of Missourians using their extension services relative to the US average increased 27% (Data from US Farm & Ranch Surveys, 2003 & 2008).

Missouri producers report that their use of the Missouri developed Woodruff Irrigation Chart Maker website has resulted in increased yields by the timely application of water. Those increased yields were reported on .8 million acres for corn, cotton, and soybeans by Missouri producers, on 13 years of MU Extension surveys, which resulted in an additional \$29 million in gross profits for Missouri irrigators. This website has national and international interest, and has been cited in many irrigation papers.

The best way to evaluate how accomplished a regional group is at irrigating is to find farmers that have both irrigated and dryland on similar type of ground, planting date, etc., and then see what the yield difference is (Δ yield). As irrigators gather more skill over time, this differential should increase. If you want to evaluate if the citizens of one region or state are gaining irrigation skills faster than citizens from another state, this can also be done. Take Δ yield at initial time and then what the Δ yield is several years later. The following shows the added Δ yield (bu/acre of soybeans) that occurred between Period 1 (1987-1997) and Period 2 (1998-2011) for the 5 states that have published data. In order of the state with the smallest Δ yield to the state that had the most improvement, they are: TX, 3.2; NE, 3.8; AR, 4.7; KS, 5.0; and, MO, 9.0 bu/acre. MO had increased its irrigated yield over dryland yield more than twice as much as the average of the other four states.