Building IPM capacity in Missouri through train-the-trainer workshops and effective partnerships

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ABSTRACT

From 2011 to 2013 the Lincoln University (LU) IPM Program partnered with the Missouri Sustainable Agriculture Research and Education (SARE) program and implemented four train-the-trainer workshops. Overall, subject matter experts from nine US states provided training to 153 Extension educators from Univ. of Missouri Extension, LU Cooperative Extension, USDA Natural Resources and Conservation Service (NRCS), Missouri Department of Agriculture, Missouri Department of Conservation, University of Illinois Extension, and University of Nebraska Extension. Educators indicated that they significantly increased their IPM knowledge leading to improved abilities to assist farmers. The implementation of these 2-day workshops also resulted in important mid-term outcomes. For example, results from 9-month post-workshop surveys indicated that: (1) 2,453 farmers were assisted by the 83 trainees that answered the survey sing IPM information received at the workshops, (2) 26.5% of the respondents wrote articles for newsletters and/or newspaper columns using IPM information (131 total outputs), and (3) 86.7% of the respondents visited 595 farms and used IPM information. Overall, the implementation of this type of Extension IPM activities has proven successful, and the outcomes highlight the efforts that the LU IPM program is taking to train Extension educators in necessary IPM skills within and outside Missouri.

INTRODUCTION

Integrated Pest Management (IPM) proponents and practitioners share interests in promoting and improving environmental quality, farm economic viability, sustainable agriculture, and soil and human health. In Missouri there is a high need to bring research-based information on all aspects of IPM to the state's citizens. The Lincoln University (LU) IPM Program was established in April, 2010, in response to that need. LU is an 1890- land-grant University located in Jefferson City, Missouri.

One of the key features of the LU IPM program is the ability of its staff to conduct farm visits throughout the state. This allows us to provide on-site advice on pest identification, prevention, monitoring, and suppression methods, thus providing farmers with a timely response to their IPM needs. In addition to working with vegetable and small fruit farmers, this program has implemented annual 'train-the-trainer' workshops targeting extension educators and agriculture service providers. Reported here is a summary of activities and outcomes derived from four In-Service Education (ISE) workshops conducted from 2011 to 2013.

OBJECTIVE

The main goal of the ISE workshops was to provide training to agricultural professionals and educators in the Missouri's Cooperative Extension Service on the most up-to-date information on sustainable IPM in various cropping systems.

APPROACH

Four workshops were offered by the LU IPM program from 2011 to 2013 (Table 1).

- ✓ After review, the MO SARE formally approved requests to conduct the IPM workshops as part of the Missouri SARE plan of work for each year.
- ✓ Univ. of Missouri (MU) partnered and provided logistical support the LU IPM program carried out the workshops (Fig 1).
- ✓ The selection of topics that were presented at each workshop was based on surveys that were implemented via online as well as direct input provided by MU / LU Extension personnel.
- ✓ Trainers were chosen based on area of expertise and geographical location.
- ✓ Each workshop had about 14 hours of effective training time.

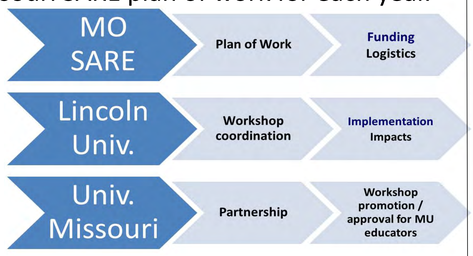

Fig. 1: Representation of the partnership between the Missouri SARE program, Univ. of Missouri and Lincoln University (a 1890 land-grant university) that led to the successful implementation of four IPM workshops that targeted Extension educators and Agriculture Service Providers from 2011 to 2013.

For each workshop, the following short- and mid-term outcomes were expected:

- ✓ Educators would increase their knowledge and awareness of the economic and environmental benefits of implementing IPM in various cropping systems in Missouri .
- ✓ As a result of the training workshops, Extension specialists would be able to make informed IPM recommendations.
- ✓ At least 10 educators would organize workshops with IPM as central topic
- ✓ All educators would improve their ability to assist farmers on effective ways of managing insect pests, weeds, and diseases.
- ✓ **EVALUATION:** Shor-term outcomes were documented via a pre- / post-workshop survey. Mid-term outcomes were recorded through an online-based 9-month post-workshop survey. Additional input was requested.
- ✓ Combining all four ISE workshops, 153 Extension educators and Agriculture Service Providers received training on IPM. Of these, 34.6% were from MU Extension, 39.2% from LU Cooperative Extension, 6.5% from MDA, 2.6% from MDC, 14.4% from NRCS, and 2.6% represented other institutions.

	No. OF TRAINEES							
Workshop (year)	Univ. Missouri (MU)	Lincoln Univ. (LU)	Mo Dept. Agric. (MDA)	MO. Dept. Conservation (MDC)	USDA NRCS	Other	SUM	TRAINERS
Vegetable IPM (2011)	12	15	0	0	15	1[a]	43	Kansas State Univ., Purdue, USDA-ARS, IPM Institute, Univ. Arkansas, Univ. Illinois, MU, LU
Small fruit IPM (2012)	10	13	1	0	2	0	26	Michigan State Univ., The Ohio State Univ., MU, LU
Sust. Mgmt. Soil-borne Diseases and Weeds (2013)	16	17	1	0	5	3[b]	42	Kansas State Univ., Western Illinois Univ., The Ohio State Univ., MU, LU
Spotted Wing Drosophila (2013)	15	15	8	4	0	0	42	Michigan State Univ., MU, LU

[a]Jefferson Institute (Columbia, MO); [b]Univ. of Illinois Extension (2), Univ. of Nebraska-Lincoln (1)

Table 1. Topics of the four ISE workshops on IPM held in Missouri (2011-2013), attendance and affiliation of the trainers who participated in the workshops.

SHORT-TERM OUTCOMES: For each of the 30 IPM topics that were taught over a 3-year period, significant increases in knowledge were documented. As an example, Table 2 presents the results from the pre- and post-workshop survey reflecting increases in knowledge for one of the workshops.

Short-Term Outcomes

Increases in knowledge of the topics of the training were assessed with a pre-and post-event evaluation

Scores used in the on-site evaluations:
1 = No knowledge, 2 = Little knowledge, 3 = Some knowledge, 4 = Knowledgeable, 5 = Very knowledgeable

TOPIC	MEAN SCORE BEFORE	MEAN SCORE AFTER	*P*-value	% INDICATING AN INCREASE IN KNOWLEDGE
Diagnosis of key soil-borne diseases affecting fruits and vegetables (Dr. Mersha)	2.8	3.9	< 0.001	84%
Vegetable grafting as an IPM strategy against soil-borne diseases (Dr. Rivard)	3.0	4.0	< 0.001	80%
Management of soil-borne diseases in organic vegetable production (Dr. Baysal-Gurel)	2.6	3.6	< 0.001	84%
When weeds win the canopy, crops lose (Dr. Smeda)	3.0	4.3	< 0.001	88%
Radishes as biofumigants and weed suppressant cover crops (Dr. Gruvel)	2.2	3.7	< 0.001	100%

A P-value of P< 0.05 denotes a statistically significant difference between the mean score values recorded before and after the training, thus a significant increase in knowledge.

Table 2. Increases in knowledge of Extension educators that attended the 2013 ISE workshop on 'sustainable management of soil-borne diseases and weeds', as documented by pre-and post-workshop surveys

MID-TERM OUTCOMES: Results from the 9-month post-workshop surveys revealed that Extension educators in Missouri improved their abilities to assist farmers as a direct result of the IPM workshops. Table 3 presents some ways in which the information presented at the workshops were used by the trainees (mid-term outcomes).

	% OF RESPONDERS			
The information I learned helped me to:	Vegetable IPM (2011)	Small Fruit IPM (2012)	Sust. Mgmt. Soil-borne Diseases and Weeds (2013)	Spotted Wing Drosophila (2013)
Answer client questions	78%	92.9%	87.0%	88.0%
Incorporate new ideas and information into regular programming	56.5%	64.3%	66.2%	41.7%
Develop special programming on the overall topic of IPM	15.3%	14.3%	17.4%	16.7%
Write articles for newsletters and/or newspaper columns / radio shows using IPM information	40.5%	7.2%	39.1%	33.3%

Table 3. Proportion of responders that indicated how they applied the information gained at the IPM workshops within a 9-month period following the implementation of the workshops.

The multiplicative effect of the workshops is presented in Table 4. It shows that the 83 Extension educators that responded to the 9-month post-workshop survey reached 2,453 farmers within the 9-month period that followed workshop implementation. They also were able to reach 482 minority and limited-resource farmers.

The information I learned helped me to:	Vegetable IPM (2011)	Small Fruit IPM (2012)	Sust. Mgmt. Soil-borne Diseases and Weeds (2013)	Spotted Wing Drosophila (2013)	TOTAL (OR AVERAGE)
Actual number of clients assisted	779	237	823	614	∑= 2,453
Actual number of Newsletter articles, newspaper columns/radio shows	40	19	41	31	∑= 131
Proportion of Educators that provided advice on IPM at farm visits and/or one-on-one interactions	79%	92.9%	87%	88%	$\bar{X}$= 86.7%
Actual number of farms visited since IPM training	125	104	123	243	∑= 595
Actual number of one-on-one interactions with farmers	244	156	230	136	∑= 766
Percentage of educators that interacted with minority/limited-resource farmers	68.2%	71.4%%	69.6%	41.7%	$\bar{X}$= 62.7%
Actual number of minority and/or limited-resource farmers that were assisted	192	106	92	92	∑= 482

Table 4. Additional mid-term outcomes documented from the implementation of four ISE IPM workshops in Missouri

CONCLUSIONS

The implementation of this type of Extension IPM activities has proven successful, and the outcomes highlight the efforts that the LU IPM program is taking to train Extension educators within and outside Missouri in necessary IPM skills. Partnerships with the Missouri SARE program and with the Univ. of Missouri have resulted in important synergisms that have benefited farmers.

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