

## **2014 Final Report for New Hampshire**

### **Project Title: Delivering Sustainable Agriculture Education Using Effective Adult Education Principles**

#### **Report Summary**

The majority of Extension educators have little knowledge in effective adult education methods. Most graduated with expertise in their subject area and not in educational methodology. The result of this situation is a reliance on lecture-based teaching events.

Research by Dr. Sandy Bell shows farmers are most likely to implement information if they are exposed to discovery learning techniques, as well as if they are challenged to assess their existing perspectives on subjects. This is especially true for complex topics. These techniques are categorized under the banner of participatory learning.

The approach of participatory learning stems from research indicating that lecture and classroom-style training are not highly effective if a topic is complex, such as nutrient management, farm management, whole farm planning, Integrated Pest Management, soil health and the like. These topics are not well suited to lecture-based learning for a number of reasons: 1) there is no one “right” answer; 2) solutions must be developed within the context of individual farms, which all differ; 3) learning new approaches often requires “unlearning” old methods; and 4) growers need direct, concrete evidence that new methods work.

There were two main goals of our program: 1) Teach farmer educators principles and skills in participatory learning methods, and 2) Increase in the adoption of sustainable agricultural practices on New Hampshire farms.

Our program utilized the expertise of three adult education faculty; Dr. Sandy Bell, Chuck Bagley, and Faye Cragin. These three conducted day-long workshops, on-line instructional courses, one-on-one mentoring and consultations, and support to integrate distance learning technology. In all over 23 outreach activities were implemented to support 18 UNH Cooperative Extension staff.

Eighteen (18) UNHCE educators reported incorporating new ideas and techniques into their programming. All program participants utilized knowledge and skills they gained from this SARE project, although the implementation varied. Often, newer (and younger educators) adopted practices more fully than senior veteran staff. Implementation practices included: using pre-session learning assignments, using webinars and conference calls as post-session support to in-person events, utilizing discovery learning methods including games, and problem solving activities, using photos instead text in presentations, using clickers to engage the audience, creating safe learning environments by setting ground rules, strategizing how to address topical areas that cause fear and anxiety in learners, altering classroom layout, using in-class time to implement new knowledge, and identifying learners’ mental models and trying to help participants overcome obstacles as a result of these.

Participants report varied changes. We have measured attitudinal changes in all participants, meaning they now think of what educational methods to use to make an impact. Participants have increased their awareness of how adults best learn, how the brain makes use of data, and how existing mental models can serve as obstacles to adoption of new practices. Further, 94% (17 educators) have reported trying at least one new approach in their educational programs. An additional six (33%) have incorporated distance learning methods in part or in total for their educational programs.

## **1. Performance Target(s)**

*Eighteen Extension educators, delivering improved curriculum in sustainable agriculture topics developed in accordance with new adult learning theory and principles, will educate 100 farmers who manage 1,700 acres. 50% of these farmers (50 farmers) will adopt at least one new recommended practice.*

## **2. Report on 2013-2014 Milestone Accomplishments**

Eighteen UNH Cooperative Extension educators implement the remainder of their sustainable agriculture curriculum using the newly acquired skills in participatory learning techniques and effective distance learning methods. The implementation will again build their skills, increase their confidence, and educate farmers. Inexpensive video equipment and software to input audio for web based distance learning programs has been included in this grant to support the development of programs for farmers. October 2013 – March 2014.

*Our final evaluation measured all 18 participants adopting new educational approaches into their programs and increasing their awareness of adult educational methods as a result of their participation in the program. The attitudinal changes, increased awareness, increased knowledge of adult education practices, and adoption of new methods are clear highlights of this three year program.*

Eighteen UNH Cooperative Extension educators attend a final day-long workshop to share synopses of their curricula and implementation plans and lessons they have learned through the implementation of their curricula. This increases their skills, aptitudes, and knowledge of using participatory and distance learning principles and methodologies to educate farmers in sustainable agricultural practices. Additionally, evaluation tools will be drafted to assess farm behavior changes and impacts that resulted from their participation in the sustainable agricultural activities. April – May 2014.

*We never held the final day-long workshop. Instead participants individually, or in teams, utilized the consultants through in-person, phone, or video-conferencing for support and assistance.*

Eighteen UNH Cooperative Extension educators submit any durable learning resources developed through the project for their teaching to the state coordinator so they can be shared with other educators and farmers via the New Hampshire state program website. May-June 2014

*We have collected a number of the curriculum, tools, and resources. This milestone is not fully completed, but on December 19, we will have an ag staff meeting where we hope to collect additional resources to populate our NH SARE Effective Adult Education Website.*

Eighteen UNH Cooperative Extension educators evaluate farmer behavior changes, focusing on the adoption of new practices and the impacts that resulted. These will be collated and sent to the program coordinator. June – September 2014.

*Individual educators likely measured behavior change outcomes from their major programs, but as Program Coordinator, I do not have these at the time of this report. I will strive to get these and submit them at a later date.*

### **3. 3-Year Summary of Activities, Participants, Learning Outcomes and Products**

**Table 1 –Activities.**

<b>Type of Educational Activity Conducted by Project</b>	<b>Number of Each Activity Conducted</b>
Workshop/Field Day	<b>5</b>
On-farm Demonstration	
Tour	
Webinar/Talk/Presentation	
Other on-line training (5-week course)	<b>1</b>
Individual Consultations (an estimate is acceptable)	<b>X</b>
Other – Between-workshop and after-course assignments	<b>X</b>

**Table 2 – Participants.**

Type of Agricultural Service Provider	Number Who Participated
Extension	<b>18</b>
NRCS	<b>0</b>
Other Federal/State Agency	<b>0</b>
Other (specify) <b>undergraduate students</b>	<b>0</b>
Total Number of Agricultural Service Providers*	<b>0</b>
Farmers	<b>0</b>

**Table 3 - Learning Outcomes.**

	Total Number of Agricultural Service Providers	Total Number of Farmers	Total number of acres or animals the farmers manage, if known
Verified an increase in knowledge, skills, confidence	<b>18</b>		
Verified intention to use knowledge and/or skills learned	<b>18</b>		
*Bulleted list of only the key knowledge and skill areas for which you verified an increase in knowledge and skills.			

**Table 4 – Products.**

<b>Type of Information Product Produced</b>	<b>Number of Each Type Produced</b>
Fact sheet/Guidance document	
Decision tool	
PPT presentations	<b>3</b>
Article (newsletter, press)	
Curricula	
Video	
Other (specify) on-line course	<b>1</b>

**4. Performance Target Outcomes and Additional, Unanticipated Outcomes**

**a. Summarized Outcome Data**

**Table 5 – Numbers of agricultural service providers taking action**

The <b>total number of agricultural service providers</b> who incorporated information and/or used skills learned through the state program training activities in their educational activities, services and/or information products for farmers.	<b>18</b>
The <b>total number of farmers</b> these agricultural service providers reached through their efforts.	<b>2,410</b>

**Table 6 – Actions taken by the agricultural service providers**

Place an X next to all that apply	Types of Educational Activities Ag Service Providers incorporated information they learned into	Number of Each Activity Type, if known
	Workshop/Field Day	<b>108</b>
	On-farm Demonstration	<b>5</b>
	Webinar/Talk/Presentation	<b>0</b>
	Other on-line training	<b>29</b>
	Individual Consultation (an estimate is acceptable)	<b>7</b>
	Fact sheet/Guidance document	<b>115</b>
	Curricula	<b>76</b>
	Article (newsletter, press)	<b>0</b>
	Web content	<b>25</b>
	Other (specify) Videos	<b>5</b>

**Table 7 – OPTIONAL - Actions taken by farmers – Not measured in our project.**

The <b>number of farmers</b> who made a management change as a result of learning from the project activities and/or the trained agricultural service providers?	
Bulleted list of the changes made by farmers	
Number of acres, animals, or other appropriate production units that were affected by these changes. <i>(please enter your best estimate; you may leave this blank if you have no idea)</i>	

**Table 8 – Additional outcomes as a result of the project**

Type of Outcomes Achieved	Number of Each Outcome
New working collaboration	2
Grants applied for	
Grants or other funds received	2
Other (describe) <b>Invited speaker</b>	<b>5</b>

**b. Outcome Narrative**

This project has had an amazing impact on both the agricultural resources staff of UNH Cooperative Extension, and the organization as a whole. Upon learning of Dr. Sandy Bell’s work in the subject area of effective adult education for farmers, I was moved to utilize her techniques to improve educational impacts in our state. UNH Cooperative Extension has tremendously skilled agricultural educators in terms of subject area content, creativity and innovativeness. Yet there was a lack of knowledge and skills in adult education philosophy and methods, leaving educators to rely on lecture based educational methods. I would see the limited impact these methods had on farmer adoption and engagement. A conversation with the Agricultural Program Team Leader confirmed that this would be an important area in which to build skills.

After putting this program together, many staff members from non-agricultural programs desired to participate. In fact, other Program Team Leaders requested that their staff be allowed to participate. The organization thought this was a very important topic area to in which to build skills. Coincidentally, Extension organizations across the country had identified that this is a key area for Extension to evolve and transform.

Eighteen participants registered and participated in this program. This project impacted all 18 participants. Prior to this project, participants did not consider educational methodology in their program planning. They did not know how the brain processes information, nor the fundamental aspects of adult education.

Learning Outcomes

The evaluation results show an increase in the KASA outcomes for all of these participants. Below are highlights of skills in which we have documented outcomes.

Knowledge – 18 participants (100%) cited and demonstrated increased understanding in adult education methods. The following topic areas were listed: how the brain absorbs (or omits) data, how the brain processes or deletes information, the impact of mental models on absorbing/accepting new information, understanding of how to change mental models, the need for “before”, “during” and “after” program educational activities, how to design effective on-line courses, and how to design effective activities and presentations.

Attitude and Awareness– Fourteen of the 18 (75%) participants had a change in how they thought of planning their educational programs and increased their awareness of effective learning methods. They cited the following:

- I think the training was useful because we consciously considered adult learning methods, and were forced to think about the way we teach.
- It has made me more aware of not knee jerking to PowerPoint for everything.
- I am more aware of my own teaching and lecture approach, and am more astute at reading the audience.
- Before I just thought about making sure that all the subject matter was covered when designing a program. Now when I put something together, I try to design it around the audience and where they're coming from (if possible have growers/farmers participate in the planning).
- I look at programming totally differently. Not only do I use a logic model perspective to try and achieve action outcomes, I also now consider educational methodologies.
- It has given me a better appreciation of how adults learn, and how I can design programs that use these concepts

Skills – All 18 participants (100%) built new skills in adult education methods. These include:

- I took away a few key points that I've used in several programs. One example is to give participants choice of the content; this is easy to do, and makes everyone more engaged in what's going on. Another is to encourage active participation. I think that more often implementing these strategies make me more effective.
- I try and integrate different teaching methods at all the workshops I collaborate on. That includes using technology, integrating "fun" quizzes, having shorter lectures, integrating hands-on activities, and breaking out of the comfort zone as a teacher.
- Before I just thought about making sure that all the subject matter was covered when designing a program. Now when I put something together, I try to design it around the audience and where they're coming from (if possible have growers/farmers participate in the planning), try to include several different teaching methods, and small group learning. I've found that small group learning is very effective, especially when groups present to each other.

- I have tried to incorporate more technology
- I also use adult methods to affect behavior change and increase learning and processing.
- I have changed my method of teaching.
- More farmer participation into the program results in more farmer ownership and support in the program
- I try to have more hands on activities and prepare my programs so that the participants are teaching each other as much as I'm teaching them.

### Action Outcomes

A survey asked participants, “How many program had they incorporated adult education methods that they learned over the past three years?”

Thirteen participants responded to the question and all thirteen (100% of respondents and 72% of all program participants) had multiple programs. The raw data show the following numbers: 10, 13, 2, 7, 15, 21, 8, 4, 12, 10, 6, 3 and 4 respectively. This brings the total to 115 programs at the minimum, a clear indicator of behavior change.

Specific changes included:

- Sending pre-session educational information to reduce in-session lecture and focus more on processing and learning during the session
- Using interactive learning activities during the session to process information
- Assigning homework after sessions to process information
- Conducting webinars following sessions as a post-session activity to provide follow-up
- Incorporating on-line journaling, blogs, and forums into courses to increase content retention, build post program communities, and increase adoption of practices
- Limiting lecture times so as not to overwhelm the participants
- Reducing text on slides and incorporating more graphics to gain participants attention
- Accounting for participants’ emotions by recognizing topics that involve fear and trying to incorporate surprise and happiness when possible. This includes easier problems at the start to build confidence, working in teams to help people succeed, providing tools such as spreadsheets to help people overcome math fears.
- Using questions at the beginning of programs to assess participants’ “mental models” so that the instructors and the participants themselves can identify these and manage for them.

Participants were asked to name specific ways their programs were improved as a result of the three year SARE Program, below are their comments:

- We developed a game and practical exercise for pesticide safety trainings.

- We've started using clickers to solicit information from participants at a large annual meeting for fruit and vegetable producers.
- We developed a practical exercise for participants in a cover crop/soil health workshop this week. It breaks things up, gives people a chance to apply what they've learned and gives us a chance to gauge where the participants are in ways traditional evaluations don't always show us.
- I don't really have a before and after comparison, so it is difficult to answer this one. As I mentioned above, my teaching techniques and habits are being shaped by what I learned in the Adult Education training.
- It was great to have this training available to my whole team so we could learn and change together instead of one of us trying to change the status quo by ourselves. I believe our programs are more hands on and engaging now that we are more aware of (many) useful teaching techniques that we were able to easily integrate into our teachings.
- We have increased participation and interaction among attendees; much better evaluation results (people include more comments and take the time to offer written feedback and suggestions for future programs); very rare to see eyes glazing over even when material is dry (rules & regs, pesticides, etc.)
- I create more specific evaluation questions to get better input from my clients
- They are more interactive, I give participants choices, I cover less material, and I use pre-, during and post follow ups. I also use more technology.
- Allowing more formal networking time among participants, whether in small groups or larger groups to discuss their ideas, best practices, challenges, allowing them to learn from each other.
- Pumpkin nutrient application versus increase in specific gravity of pumpkins (increase weight) - research planning and plot work.
- Program development with farmer participation in Annual Meeting of the New Hampshire Fruit Grower and Risk Management fall meeting for Tree Fruit Orchardists
- Farmer involvement panel discussion
- Active participation in checking and reporting IPM scouting and monitoring of traps
- Farmers are more engaged, and learning more from each other.
- At one on-farm meeting in October, I held a discussion segment about the past growing season. We briefly touched on several topics, but there were a couple issues that had some extended discussion, with farmers chiming in with their own experiences, which reinforced the point I was looking to make. One farmer mentioned afterward how much he liked these kinds of sessions.

## **Performance Target Outcomes**

See outcome narrative above

## **Other Results, Unanticipated Outcomes and Interesting Finding**

Several other notable results from this project:

- The UNH Cooperative Extension Pesticide Team was invited to present at a national Pesticide Safety Conference about the new curriculum they created as a result of the SARE training.
- Another staff member (me) was asked to present on Effective Adult Education Methods for the following audiences:
  - eXtension national webinar for Extension educators (250 people signed in)
  - Manitoba Agronomy Council –Canadian agricultural educators (25 people signed up)
  - Holistic Management International – 35 agricultural educators from around the country signed in.
  - UVM Cooperative Extension – Was asked to perform an in-service for UVM Cooperative Extension staff.
- A UNH Cooperative Extension program was developed by Faye Cragin similar to our SARE Program so all Extension staff could gain the skills we were teach agricultural staff.
- UNH Cooperative Extension is allocating human resources to support the skills taught I this grant for all staff.

## 5. 2013-2014 SARE Outreach Activities

Event/Activity	Number of Contacts <i>(please enter your best estimate)</i>	
	Farmers	Ag. Professionals
Twilight Meeting – Kingman Farm, Madbury, NH	50	10
Carroll County Twilight Meeting – Spider Web Gardens, Tamworth, NH	65	8
Farm and Forest Exposition, Manchester, NH	16	18
Ag Professional Day – January, Concord, NH		27
Grazing Twilight Meeting	12	2
Campus State Specialists, Durham, NH		9
One-on-one personal consultations	5	
One-on-one phone consultations	9	4

## 6. OPTIONAL – Assessment of Project Approach /Lessons Learned/Future Recommendations

We used several project methods over the years of this program. We used in-person sessions that were well attended but limited in efficacy. People struggled with sitting through classes that had new vocabulary, new concepts and were at first too lecture oriented. The new concepts also threatened their existing paradigm, which caused some defensiveness.

The first year's sessions were held in the summer which was a very busy time of year. This precluded homework assignments from being completed by the masses.

The second year featured an on-line class that was very successful. It taught effective distance learning methods through actual implementation. The only drawback was the amount of work it involved. Participation dropped off due to very busy schedules during the last session of this 6-week course.

One of the most memorable sessions was when Dr. Bell came and simply answered participants' questions for a day. She came prepared with presentations, but used these only as they pertained to specific questions. We all learned from each other's questions, comments, and experiences.

One-on-one consultations were also highly effective. Participants called Dr. Bell, Chuck Bagley, or Faye Cragin for specific help or program support. This was a very valuable part of the program. It allowed participants to take concepts they learned from workshops, readings, or other program activities they participated in and create programs with support from “experts”. This built their confidence and skills.

I am not sure I have universal recommendations, yet I would try to select a time where the majority of staff were not as busy as when we implemented our workshops and on-line classes.

I like the use of multiple instructors, it provided different perspectives and participants seemed drawn to different people.

Providing resources such as cameras and software (Snagit) was very helpful for participants to implement technology into their programs.

Patience is a key factor, especially for veteran staff. New staff were far more willing to adopt practices and principles, while veteran staff were resistant at first, if not throughout the project.