

2014 Final Report for Delaware State University with UDEL and UMES

Project Title: Sustainable Season Extension

Report Summary

Why this project?

Agriculture in Delaware and the Eastern Shore of Maryland, like more northern regions, is limited in length by colder times of the year. This time of inactivity for a farming enterprise as a whole and for specific crops within an enterprise can be the difference between annual profit and loss, especially among small farms. Although, it can be difficult to engage agriculture service providers with topics outside of their specialty, an interesting thing about season extension is that it offers learning opportunities for agricultural service providers working in many categories of agriculture, including economics, IPM, alternative tillage strategies, environmental conservation, and the production of fruit, vegetables, livestock, and ornamentals. Many of these service providers are not fully aware of the wide spectrum of knowledge and skills necessary for farmers to successfully implement season extension, or of the roles they can play in helping farmers be successful. Furthermore, many farmers in the region have been leading some agricultural service providers in their interest in and adoption of season extension strategies. There are also many challenges specific to farmers including developing effective yearlong management plans, utilizing new techniques, and finding off-season markets for sales.

What was done in this project to address the problem?

A comprehensive curriculum was developed with 12 season extension strategies presented with technical knowledge, economic considerations (including pricing quotes & estimated time to make back investments), and opportunities & challenges. The 12 strategies are as follows:

- 1. High tunnels/ greenhouses*
- 2. Low tunnels/ row covers*
- 3. Basic, underused IPM techniques in tunnels and greenhouses including bunker plants, sticky traps, and rabbit/rodent barriers*
- 4. Vegetable transplants*
- 5. Using colored mulch to effect soil temperature*
- 6. Staggered plantings and stretching harvest seasons for individual crops*
- 7. Growing cut flowers from early spring to late fall for additional revenue and to attract pollinators.*
- 8. Storage crops including sweet potatoes*

9. Common cold weather crops

10. Extending market and selling seasons, including lengthening farmers' market seasons and increasing vendor offerings, early and late

11. Adding value and shelf life with canning and processing

12. Increasing livestock growing/laying rates in cold weather

In the three-year period, 22 trainings were held plus one-on-one consultations with a total of 1011 farmer participant and 36 distinct Agriculture Service Provider participants, many of whom attended multiple events. Activities included farmer panels, conference sessions, farm tours, classroom workshops, local farm bus tours, and demonstrations.

What happened as a result of this project?

As a result of this project, Delaware State University now has two full time extension educators that focus largely on high tunnel fruit and vegetable production as well as season extension strategies, in general. This programming will continue long after the SARE project has ended. There are 12 additional Agriculture service providers in Delaware and the eastern shore of Maryland that have incorporated learned season extension strategies and technical aspects in their educational programs. In total, these 14 educators have shared learned behavior with at least 179 farmers who farm more than 1,000 acres.

At the start of DSU SARE season extension programming, the exact number of high tunnels in Delaware is unknown but is believed to be fewer than ten. Since then, at least 44 high tunnels have been constructed and are currently in fruit or vegetable production with an additional 14 in contracts to be built in the next year. These farmers have directly benefited from SARE programming and continue to receive assistance from SARE Ag service provider beneficiaries. At least 63 farmers, (most of whom now have high tunnels) have adopted at least one of the remaining season extension strategies.

At the start of DSU SARE season extension programming, DSU only had one high tunnel for demonstration and research. High tunnels and season extension did not have any programming focused around them. Now there are five high tunnels in operation at DSU's research and outreach farm with regular programming continuing indefinitely. Two large Capacity Building grants have been awarded for programs based directly on SARE educational activities. NRCS had been a partner previously, but now has become a major collaborator in nearly all programming, with the inclusion of the High Tunnel Initiative. This partnership has been a major success for both programs by encouraging adoption of learned behavior and increasing farmer inclusion in NRCS funding programs.

1. Performance Target(s)

12 Ag Service Providers will include at least one learned season extension practice in their programs, which will be shared with 75 vegetable farmers, who farm 700 acres.

30 vegetable farmers, who farm 250 acres and are reached directly through state programming will adopt at least one learned season extension practice and as a result, increase profit by at least \$500 each.

2. Report on 2013-2014 Milestone Accomplishments

1. 50 Ag service providers and 400 farmers receive promotional materials for workshops/meetings to become aware of programs (9/1/2013-4/30/2014)

45 Ag service providers and 650 farmers received promotional material for season extension workshops/meetings this year.

2. 10 Ag service providers and 20 farmers attend workshops/meetings to learn strategies and introduce SARE PDP (9/1/2013-4/30/2014)

This year, 319 farmer participants and 24 Ag service provider participants attended seven events, plus one-on-one consultations.

3. 7 Ag service providers agree to include strategies in programs and report outcomes to benefit farmer audiences (9/1/2013-4/30/2014)

Over the length of the project, 17 Ag service providers agreed to include learned strategies in their programs.

4. 5 Ag service providers include strategies and report outcomes to benefit farmers and Ag service provider performance (9/1/2013-4/30/2014)

Over the length of the project, 14 Ag service providers included learned strategies in their programs.

5. 15 Farmers agree to add at least one strategy to farm to increase profits (9/1/2013-4/30/2014)

During this time period, 22 farmers agreed to include learned strategies in their programs.

6. 10 farmers adopt at least one strategy to increase profits (9/1/2013-4/30/2014)

During this time period, 12 farmers included at least one strategy.

7. 15 Ag service providers and 25 farmers will receive season extension publication (video and/or paper) to learn strategies and introduce SARE PDP (9/1/2013-4/30/2014)

14 Ag service providers and 54 farmers received a season extension publication.

8. 10 Ag service providers and 20 farmers complete survey (paper, electronic, or oral) to verify actions taken (4/30/2014-6/30/2014)

17 Ag service providers and 67 farmers completed oral surveys to verify actions taken.

9. 30 Ag service providers and 60 farmers complete Year-3 final project verification survey (paper, electronic, or oral) (4/30/2014-8/30/2014)

Due to the limited number of Ag service providers in the state, we feel that this was not a practical milestone and additionally should have been combined with milestone number 8 because they were done simultaneously. 17 Ag service providers and 67 farmers completed oral surveys to verify actions taken.

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

Table 1 – Activities.

Type of Educational Activity Conducted by Project	Number of Each Activity Conducted
Workshop/Field Day	17
On-farm Demonstration	3
Tour	2
Webinar/Talk/Presentation	
Other on-line training	
Individual Consultations (an estimate is acceptable)	127
Other (specify)	

Table 2 – Participants.

Type of Agricultural Service Provider	Number Who Participated
Extension	10
NRCS	7
Other Federal/State Agency	19
Other (specify)	
Total Number of Agricultural Service Providers*	36

Farmers	1011
---------	------

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	28	212	Approximately 750
Verified intention to use knowledge and/or skills learned	17	
*Bulleted list of only the key knowledge and skill areas for which you verified an increase in knowledge and skills.			
<ol style="list-style-type: none"> 1. <i>High tunnels/ greenhouses</i> 2. <i>Low tunnels/ row covers</i> 3. <i>Basic, underused IPM techniques in tunnels and greenhouses including bunker plants, sticky traps, and rabbit/rodent barriers</i> 4. <i>Vegetable transplants</i> 5. <i>Using colored mulch to effect soil temperature</i> 6. <i>Staggered plantings and stretching harvest seasons for individual crops</i> 7. <i>Growing cut flowers from early spring to late fall for additional revenue and to attract pollinators.</i> 8. <i>Storage crops including sweet potatoes</i> 9. <i>Common cold weather crops</i> 10. <i>Extending market and selling seasons, including lengthening farmers' market seasons and increasing vendor offerings, early and late</i> 11. <i>Adding value and shelf life with canning and processing</i> 12. <i>Increasing livestock growing/laying rates in cold weather</i> 			

Table 4 – Products.

Type of Information Product Produced	Number of Each Type Produced
Fact sheet/Guidance document	1
Decision tool	
Website/web content	1
Article (newsletter, press)	
Curricula	
Video	3
Other (specify)	

4. Performance Target Outcomes and Additional, Unanticipated Outcomes

a. Summarized Outcome Data

Table 5 – Numbers of agricultural service providers taking action

The total number of agricultural service providers 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.	14
The total number of farmers these agricultural service providers reached through their efforts.	179

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
X	Workshop/Field Day	9
X	On-farm Demonstration	6
X	Webinar/Talk/Presentation	26
	Other on-line training	
X	Individual Consultation (an estimate is acceptable)	250
X	Fact sheet/Guidance document	2
	Article (newsletter, press)	

X	Web content	1
	Other (specify)	

Table 7. Actions taken by farmers

The number of farmers who made a management change as a result of learning from the project activities and/or the trained agricultural service providers?	63
Bulleted list of the changes made by farmers	
<ol style="list-style-type: none"> 1. 44 Farmers constructed High tunnels. 2. 4 Farmers constructed Low tunnels/ row covers. 3. 15 Farmers increased the use of basic, underused IPM techniques in tunnels and greenhouses including bunker plants, sticky traps, and rabbit/rodent barriers. 4. 45 Farmers utilized Vegetable transplants. 5. 7 Farmers utilized colored mulch to effect soil temperature. 6. 41 Farmers utilized staggered plantings and stretching harvest seasons for individual crops. 7 10.Farmers added cut flowers for additional revenue and to attract pollinators. 8. 8 Farmers added storage crops including sweet potatoes. 9. 15 Farmers added common cold weather crops. 10. 3 Farmers extended their selling seasons. 11. 4 Adding value and shelf life with canning and processing. 12. 5 Increasing livestock growing/laying rates in cold weather. 	
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 – OPTIONAL – Additional outcomes as a result of the project

Type of Outcomes Achieved	Number of Each Outcome
---------------------------	------------------------

New working collaboration	<u>1</u>
Grants applied for	<u>2</u>
Grants or other funds received	<u>2</u>
Other – New High tunnels constructed on DSU’s farm	<u>4</u>

b. Outcome Narrative

Performance Target Outcomes

The two significant outcomes of this project are the tremendous number of farmers who have adopted season extension strategies, especially the construction of high tunnels, and a continuing robust season extension program at Delaware State University. Verification was done largely by verbal and electronic communications with service providers including extension educators and NRCS staff. Additional verification was done directly with farmers. This goes well beyond the Ag service providers who included a learned technique in their program because two full-time DSU extension educators (Michael Wasylkowski and Dr. Rose Ogutu) are continuing regular season extension events, research, and individual consultations. This SARE season extension project has not only provided them with the technical knowledge necessary, but also instigated and encouraged them to fill this developing niche as a major focus of their work. By next year, there will 58 more high tunnels in production than at the start of the project, requiring continual assistance for these Ag service providers. These high tunnels also represent a very significant investment on Delaware farms and could contribute to a major shift in Delaware agriculture. Individual farms will be able to garner additional sales and the types of crops available during certain times of the year could be altered on wide-scale level.

Additional season extension strategies have also been widely incorporated into farm management plans, especially on farms that now have high tunnels. A broad, multipronged approach to extending seasons has been expressed and largely accepted by farmers and Ag service providers.

Other Results, Unanticipated Outcomes and Interesting Finding

A very effective group of participants of this project were NRCS staff, who does not carry out production management activities. However, they do interact and assist hundreds of farmers and can encourage adoption of practices through funding programs. Training them at the start of their High Tunnel Initiative allowed for the improvement of the program and created more practical farmer requirements. The training also improved their ability to make recommendations to farmers and to seek further technical assistance from DSU’s SARE programs. Combining NRCS funding with more technical trainings from the SARE program

produced robust farmer outcomes. Nearly every single farmer who has received an NRCS high tunnel has directly benefited from DSU SARE programming.

Two DSU extension educators applied for and received two different Capacity Building Grants as a result of DSU’s SARE season extension programming. Dr. Brigid McCrea, Poultry Specialist, was awarded \$200,000 to raise poultry in an “Airstream” tunnel, which was showcased in a SARE field day workshop. Dr. Rose Ogutu, Horticulture Specialist, was awarded \$247,230 for extending production seasons of fruits and vegetables, based on knowledge gained at several SARE programs.

DSU’s Outreach and Research farm has received a major improvement in its capabilities to assist farmers and empower extension educators and researchers. The number of high tunnels at the farm increased from one to five during DSU’s SARE season extension programming. Additionally, many other season extension strategies have been showcased at the farm including low tunnels, vegetable transplants, cut flowers, cold weather crops, colored mulch, storage crops, and rodent barriers in high tunnels.

5. 2013-2014 SARE Outreach Activities

Event/Activity	Number of Contacts <i>(please enter your best estimate)</i>	
	Farmers	Ag. Professionals
Grant Writing Workshop Nov 13, 2013	24	6
On Farm Workshop Dec 4, 2013	12	3
Profiting From A Few Acres Conference Vendor Booth Dec 17, 2013	45	17
Ag Week SARE grant presentation Jan 15, 2014	91	14
CASA Future Harvest grant workshop Jan 18, 2014	22	5
SARE Grant writing Presentation at workshop May 29, 2014	49	11
DE State Fair Vendor Booth July 18, 2014	18	8
DE State Fair Vendor Booth July 25, 2014	22	8
One-on-one SARE Grant Meetings throughout year	11	6
Totals	294	78

6. Assessment of Project Approach /Lessons Learned/Future Recommendations

One key aspect of this project was the collaboration with NRCS, which started its High Tunnel Initiative in 2010. This allowed opportunities for benefits on a few levels. First, NRCS staff understandably had little knowledge or expertise about high tunnels. This allowed DSU to train NRCS staff and help guide the initiative to make farmer requirements more reasonable. It also provided NRCS staff with key knowledge to better be able to assist farmers that reached out to them. The initiative also provided a funding source to encourage farmers to construct high tunnels and adopt behavior change. This NRCS program was at least briefly described at every educational event. In some cases, an NRCS staff member attended events and discussed several programs along with the High Tunnel Initiative. In other cases, the Regional SARE Educator conveyed key aspects of just the high tunnel program to attendees.

Obviously, this case is somewhat unique because a funding program was just being rolled out at the start of this SARE project. However, nearly every sustainable agricultural educational program will be seeking farmer adoption of techniques that have some funding initiatives to support them. Dispersing funding opportunities to farmers can be a major encouragement for meaningful behavior change as long as key technical considerations are included, as well.

In the specific case of season extension, one of the biggest hurdles, which we were aware of even in the planning stages, is for farmers to access markets in order to sell extended season goods. Delaware had very few high tunnels or season extension strategies being used at the start of the project and, therefore, had very limited off-season market opportunities. This provided a very difficult challenge to overcome and meaningful change would require a long-term approach from a broader perspective. Other season extension projects should consider the challenges associated with this and, ideally, collaborate with other organizations, including state Departments of Agriculture, farmers' market associations, and localized marketing opportunities. Extending market opportunities throughout the year must combine broad and localized approaches with short and long-term goals.