

# West Virginia Department of Agriculture

## **SPECIALTY CROP BLOCK GRANT PROGRAM**



# **12-25-B-1263**

# Final Report

Submitted by:  
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**Applicant: Gilmer County Economic Development Association**  
**Project: “Farmers’ Market Collaborative”**  
**Amount Requested: \$9,000.00**

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### **PROJECT SUMMARY**

This Project was a continuation of a previous grant with SCBGP 2010 # 2-25-B-1103, which involved students and youth of the counties. The emphasis was on promoting sustainable agriculture through good stewardship of the land without pesticides. Beekeeping classes were held for 7 students for 5 weeks. The students build their hives and were taught to tend the bees.

Other classes were held regarding growing crops from seed to harvest for 24 students. These classes started in the classroom to the greenhouse and then to their garden plots.

Both the classes were part of an entrepreneur development for students to track progress to the end product, sales at Farmers Market. This project got more students involved than in the previous year’s grant, because of the new Vo-Ag teacher/ leader of the FFA of Gilmer County.

The motivation for this project was the development of a viable community market for specialty crops in a designated food desert. There is a documented lack of fresh produce as well as lack of participation with the loss of a large specialty crop vendor. To address these issues, a focus on involving youth in entrepreneurial project tied specifically to specialty crops in production and selling was the approach taken and the focus of the activities of this project.

### **PROJECT APPROACH**

Beekeeping Classes with the purchase of equipment and books for the new students this past year were held. All this included the purchase of the Bee Colonies. In addition 4 extra Colonies were purchased to replace the bees lost from the previous year due to extreme weather this past winter. The additional 4 colonies totaled \$509.30. This got the students back on track with their hives.

Starting in January the greenhouse got underway with students starting seeds of vegetables, herbs, and flowers. The greenhouse was at capacity with plants that were for sale both there and at Farmers Market. Total sales for the greenhouse and Farmers Market were \$8,416.50. A percentage of the plants were retained for the students to grow in their gardens.

The grant supplied seeds, soil, containers, and products for marketing the plants and produce.

### **GOALS AND OUTCOMES ACHIEVED**

Students brought strawberries, raspberry, and blueberries to Market from the plants from last year. These will be producing for years to come. They have learned to care and prune for a better harvest.

The late summer and early fall has seen the proceeds from the potato crops. They have been sold by the pound or bushel.

Without the new leadership in the classroom and the FFA this project would not have had the success it did. A new energy was very evident increasing the numbers of students involved. The FFA members have doubled in size.

Honey production was available for the 2012 farmers market as well as 6 active beekeepers exceeding the original target of 4. The students have sustained this portion of the project and after assessment of the 2014-2015 winter survival rate, plan to add to their existing 6 hives. All hives have passed 2 years of state inspection and the students have each exceeded the “C” grade tied to achievement of the SAE goals within the FFA program area.

Sustainable agriculture was also a focus of the outcomes of this project. Students have reinvested more than \$8,000 back into the school agriculture program (i.e. greenhouse upgrades, maintenance and the ability to accommodate the increase of 40 students in the agriculture program throughout the time of this grant. The greenhouse has wintered over plants for the community and 2015 plans have already been implemented for increased production (in a 24’ x 15’ wide facility; focus on efficient production) and produce availability at the market after the grant has expired.

The students provided kale (fixed in several formats by the Culinary Arts class), sweet potatoes, multi-colored beets and carrots as well as different varieties of greens and other produce for the 2012 and 2013 Harvest Dinners. This produce did fill the gap created by the loss of a large produce vendor in the county.

Student participation in the honey production component contributed to the final outcome of the project which was the successful and sustainable maintenance of at least 4 beehives for economic benefit and grading. In addition to the curriculum and hive numbers reached (and exceeded by 2), one student successfully took the honey produced and developed value added products (lip balm and honey soaps) resulting in a \$700 contribution to the project proceeds. With more than 40 additional students with plans to include the farmers market in the future, this project will definitely continue the 50% investment into the future of this project beyond the grant.

### **BENEFICIARIES**

The residents of Gilmer County, as well as, Calhoun County and Lewis have benefited from this grant cycle. The students and their families have made profits from their sales both at their farms and Market.

Specifically, the average number of vendors selling specialty crops at the market has grown from 6 to 12 per week with an expanded growing/market open period of the 2<sup>nd</sup> weekend in May until the end of October. In addition to more local produce, vegetable plants and honey available to the market patrons, the average attendance has grown from an average of 40 patrons a week to more than 60 (on average). Expanded specialty crops, increased vendors and an investment in market infrastructure from funds separate from the specialty crop block grant to benefit the qualified growers include infrastructure additions (additional temporary shelters, water access

and partnerships to insure sustainability (Master Gardeners) all serve to compliment the grant activities focused on youth and the community.

Local restaurants have gained as well with the local produce throughout the season. Many senior citizens have had the opportunity to buy local fresh produce some with vouchers and some with cash.

All of the above has retained monies in the County making an additional economic impact.

### **LESSONS LEARNED**

The students are very enthusiastic regarding sustainable agriculture and have learned many new things they have never tried before including eating fresh produce and learning to prepare and preserve. Cooking demo's proved to explore different vegetables and fresh herbs for seasonings.

The negatives learned were the lack of parental involvement. Some of the parents would not provide transportation for students. Some wanted the students to pay for gas to and from Market. Although this was a negative, it also showed the students that it was the price of doing business.

### **CONTACT PERSON**

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### **ADDITIONAL INFORMATION**

The program has spent \$509.30 on replacement bees, and \$1375.50 on greenhouse supplies and \$149.50 on seeds and plugs. See attached. Total \$2034.30

**Applicant: Tamarack Foundation**  
**Project: “Tamarack Farmers Market”**  
**Amount of Grant: \$5,000.00**

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### **PROJECT SUMMARY**

The Tamarack Farmers Market focuses on the development and eventual expansion of providing an upscale location and an additional location featuring specialty crop foods and value added specialty crops and items. Since most local farmers markets take place during the week or on Saturdays, it was felt a Sunday market was an untapped market. Both Tamarack and the vendors benefit. The vendors have a new customer source from the traveling public and Tamarack benefits from those stopping to shop the market which adds to their overall experience. Eighty percent of Tamarack’s visitors are the traveling public.

Tamarack saw a need to work with local producers to provide additional locations to promote home-grown and hand produced items whether it is vegetables, breads or jams and jellies; by-in-turn, establishing a contact between local growers and local customers.

Tamarack has a large visitor count on Sundays and local producers are able to tap into this additional market.

This project was not previously funded through SCBGP or SCBGP-FB.

### **PROJECT APPROACH**

A flyer was created promoting local farmers markets in the area. These were handed out during the Sunday market. At the end of each Sunday market sales figures were gathered from each vendor to measure profitability for vendors. The Tamarack Farmers Market features a wide variety of items which include home-grown vegetables, jams and jellies, baked goods, and local nurseries.

The fund expenditures were used to establish a viable market by purchasing tents and signage which created an upscale atmosphere for visitors to Tamarack. We also developed a list of Farmers Markets within a five (5) county area to promote specialty crop producers to a larger audience. As result, we increased specialty crop sales dramatically by establishing a Sunday market which no other area Farmers Market offered.

There were no project partners on this project.

#### **○ 4th Quarter 2011**

Work with WV Department of Agriculture and the WVU Extension Service to identify potential vendors.

- Tamarack Staff met with Cindy Martel, WV Department of Agriculture, who provided contact information for the WVU Extension Service Agents within a 50 mile radius.
- Tamarack conducted five informational meetings for specialty crop food producers within a fifty mile radius of Tamarack. Fayette, Mercer, Monroe,

- Nicholas, Raleigh, and Summers Counties were targeted. Each county's WVU Extension agent attended and distributed information to their participating vendors not attending.
- Meet with Crook Brothers Market to discuss cross promotion.
    - After discussions with the WV Farmers Market Association Tamarack decided not to include Crook Brothers because they are not a true farmers market. They buy wholesale from all over the east coast.
  - **1st Quarter 2012**

Schedule five (5) information exchange meetings in locations previously listed. Initiate application process for selection of the first four (4) anchor specialty food producers. Tamarack will ensure that all specialty crop producers will be qualified under terms and conditions of the grant.

    - Tamarack conducted five informational meetings for specialty crop food producers within a fifty mile radius of Tamarack. Fayette, Mercer, Monroe, Nicholas, Raleigh, and Summers Counties were targeted. The WV Extension agent for each area attended.

Create signage. Tamarack Staff worked with the Stonewall Group to create Tamarack specific signage promoting the farmers market. This included signage for each of the producer canopies, and signage that was placed at the main entrances to Tamarack vehicular traffic.

Order canopies. Four 10x10 standard market canopies were ordered and used each Sunday by the attending vendors.

Begin marketing campaign. Tamarack promoted the market on local radio and newspapers. It also made use of social media in promotion such as Facebook.
  - **2nd Quarter 2012**

Schedule one (1) meeting for selected four (4) anchor specialty food producers to review procedures and rules for participation. All other interested specialty food producers who would provide their own canopies/booths would also be invited to participate. An initial meeting was held the morning of the first day of Market 2012. Rules and regulations for participation were discussed with vendors. Rules and Regulations were mailed weeks before for review by vendors.

Open market on May 6, 2012. After discussion with vendors, it was decided to open the market on June 10, 2012. Opening day of the market usually opens when the most produce is available.
  - **3rd and 4th Quarters 2012**

Market open each Sunday from 10:00 a.m. to 3:00 p.m. After discussion with vendors and Tamarack staff it was decided to open 11:00 a.m. to 3:30 p.m. due to the peak hours for visitor attendance.

Measure sales figures each week. After each Sunday market sales and visitor attendance was collected and recorded from each vendor.
  - **1st Quarter 2013**

**Work with WV Department of Agriculture and the WVU Extension Service to identify potential vendors within a fifty mile radius of Tamarack.**

**Promote and recruit potential specialty food producers through the West**

**Virginia Department of Agriculture “Market Bulletin.”** These two items were not in our initial grant submission for the 1<sup>st</sup> quarter of 2013. We found they were not necessary in the subsequent year. Through word of mouth and mailings Tamarack was able to recruit additional vendors. Additional vendor outreach was also done with site visits to the Charleston Farmer’s Market and the Fayetteville Farmer’s Market to recruit potential crop producers from the region participating in the Charleston market.

Initiate application process for selection of the three additional specialty food producers who would be placed under Tamarack canopy/booths. In early 2012, Tamarack sent out Application and Rules and Regulations to 2012’s attending vendors for registration for the coming years’ market. Additional information and applications were sent out to landscape suppliers, florists and greenhouses in the five county area.

Order additional signage. Additional signage was ordered to be attached to canopy fronts which promoted the Tamarack Farmer’s Market.

Order three additional canopies. Three additional canopies were purchased to bring the total to seven.

Promote other local farmers markets. A hand-out was created with listings of local farmer’s market location and time.

- **2<sup>nd</sup> Quarter through 4<sup>th</sup> Quarter 2013**

Market open each Sunday from 10:00 a.m. to 3:00 p.m. Market hours of 11:00 a.m. to 3:30 p.m. was carried over from previous year.

Measure sales figures each week. After each Sunday market sales and visitor attendance was collected and recorded from each vendor.

### **GOALS AND OUTCOMES ACHIEVED**

Additional vendors were recruited through word of mouth and mailings to reach our goal of eight. Specialty food producers, florists and green houses were targeted through mailings.

A variety of vendors were solicited along with vegetables, such as bread, flowers and landscaping items.

A total of seven canopies and signage were purchased for exclusive use by the market vendors.

One digital scale and one cart were purchased for exclusive use by the market vendors.

Radio ads were utilized to attract the local customer base. We feel that we achieved this goal because sales were up by 32%.

Measurable outcome was based on a 12-month period.

Our goal was to grow the market and expand vendor participation along with total sales for the year. The average vendor participation for market year 2012 was five. 2013 brought an average of six additional vendors participating in the market for a total of eleven on any given Sunday.

Market sales for 2012 were \$6,727.00 and sales for 2013 were \$8,892.00 – up by \$2,165. A growth of 32%.

Our goal was eight vendors for the market. By the end of the October 2013 market Tamarack had attracted a total of eleven vendors for the season.

### **BENEFICIARIES**

Tamarack: The Best of West Virginia benefited by the additional vendors and new customers that visited the facility to take part in and purchase from the market.

A total of four farms, three bakeries, and four greenhouses participated in 2013.

### **LESSONS LEARNED**

Positive results:

Tamarack proved there was a need in local area for this type of market.

Filled a niche at Tamarack not utilized in the past.

Loyalty of vendors to a particular market.

### **CONTACT PERSON**

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**Applicant: South Morgantown Community Farmer's Market**

**Project: "Using a Community Farmer's Market to Facilitate the Marketing of Specialty Crops in North-Central West Virginia"**

**Amount Requested: \$4,000.00**

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### **PROJECT SUMMARY**

The goals of the South Morgantown Community Farmers Market (SMCFM;SMCFMA) include: 1) providing an outlet for a wide range of local growers to sell specialty crops; and, 2) educating our customers (including children), and growers, about the wide variety of specialty crops available in order to increase consumption of locally grown, fresh food .

The motivation for the project was to increase the sales of specialty crops in North Central WV.

### **PROJECT APPROACH**

**Activity One: Grower /Producer Education** the SMCFMA solicited applications for growers to attend 2012 Small Farm Conference

We offered scholarships up to \$150 each to our growers. We had 4 applications. Due to illness and a previous commitment only one vendor was able to attend for one day. Even though, we had good response from our vendors for this opportunity, we were not able to use all the funds allocated.

**Activity Two: Increase Market Awareness** by forming an advertising and planning committee to make plans for newspaper ads and activities at the market.

Responsibility fell solely on the volunteer market manger to organize this activity, therefore only a limited number of activities or ads could be planned. Furthermore, specialty crops were unavailable until late in the season due to lack of rain.

**Activity Three: Newspaper Advertising and Special Activity Supplies**

Due to adverse weather conditions the availability of specialty crops was limited until late in the season. We ran three newspaper ads for a total use of \$976.98. We also hosted a pumpkin painting event for local children using local pumpkins for a total use of \$125.00. We did not use all the allocated funds for advertising or activities.

**Activity Four: Specialty Crop Incentive Program**

The purpose of this activity was to increase sales of specialty crops. In order to accomplish this activity we ran an ad in the local newspaper that included a coupon for \$2 of market tokens for specialty crops. We had a total of 52 people redeem their coupons. Total funds allocated \$154.00. During this time we saw an approximate 15% increase in the sale of vegetables at the market. The month before the coupon was issued the average amount spent on vegetables was \$1,251.94. After the coupon was issued the average vegetable sale was \$1,470.87. We got a

late start on this program because the adverse weather caused specialty crops to come to late harvest. Even though we got a late start this program was very successful. If we were to do this again we would use social media to promote as well.

**Activity Five:** Vendor Incentive for reporting data program.

In order to complete this activity we prepared a specialty crop check-off sheet, distributed it to the vendors and paid them \$2 each for returned forms. We extrapolated the data and presented at the 2013 Small Farms Conference. We had a total of 108 surveys returned for a total expenditure of \$216.00. This program worked very well and the vendors were very willing to participate

Project partners included Monongalia Co Extension and WVDA. Both partners helped us by giving guidance in overcoming the difficulties that we had working with the grant. New solutions and timelines were outlined (see below) at the 2013 Small Farm Conference with Mellissa Hudson and Jean Smith. SMCFMA worked within the parameters of those guidelines until SMCFMA was dissolved in March/April 2013.

SMCFM lost use of the facilities at Community United Methodist Church. All agreements we had with the Church were verbal because the Market was started as a service project of the Church Missions group. The Market was asked by the Church to become its own entity for insurance reasons as well as giving the Market the ability to seek outside funding. (i.e., to apply for this grant). SMCFM then started to apply for nonprofit status. Meanwhile, changes in leadership occurred at the Church and the Market was no longer viewed as their project. SMCFM was viewed as an outside entity and the Church decided that they did not want an outside entity organizing the Market.

**New Solutions and timelines**

Problem: market is run by volunteers that do not have the time or expertise to facilitate the Specialty Crop Grant.

Solution: Our first step in resolving our problems has occurred. On February 3, 2013 an email was sent to the current board of directors requesting their suggestions on how to overcome the problem. We followed through with a conference call at 10 AM on February 4, 2013, to set our action plan.

**The South Morgantown Community Farmers Market Action Plan**

1. The Market will strengthen the Board structure with definitions of assignments and tasks for the following positions
  - a. Market Manager/President
  - b. Market Manager/Vice President
  - c. Records Manager
  - d. Treasurer
  - e. Secretary
  - f. Agricultural Advisor
2. A monthly board meeting will be established

3. The Board of Directors will establish a "Friends of the Market" support group consisting of community volunteers who are not vendors but have historically supported the market as regular customers. This support group will be charged with assisting the Board by serving as committee members to achieve the objectives of our grant.
  4. The Market Manager will contact the WVU-Davis College of Agriculture, Natural Resources and Design, Division of Resource Management to request assistance
- Also on the call was H. R. Scott, the Monongalia County Extension agent, who will work with us to help achieve our action Plan.

### Proposed Timeline 2013

#### February

1. Establishing a time frame for regular conference calls with the board
2. Hold annual SMCFMA meeting with all vendors and volunteers to address market issues:
  - including need for increased vendor participation in market management
  - Disseminate data collected from farmers on specialty crop sales
  - Discuss path for improved diversification of market product to increase market revenue.

#### March

1. Presentation of collected Specialty Crop sales data at the West Virginia Small Farm Conference in Morgantown, WV. Presentation by Member Producers and Market Manager or Record Manager.
2. Sponsor three producers or volunteers to attend Small Farms Conference at which at least one will attend sessions related to the farmers market manager track. (If funding is extended)

#### April-October

1. Volunteer meetings at the first week of each month.
2. 30 minute board meeting or conference call each month.
3. Begin collection of specialty crop data to do a comparison study to see if diversification improves market sales. (If funding is extended)

#### June-October

1. Monthly Advertisements in local Newspapers
2. Continue data collection of specialty crop data
3. Market Activities including cooking presentations featuring West Virginia Specialty crop foods and children's education activities. Coordinated by the WVU extension service.

## **GOALS AND OUTCOMES ACHIEVED**

Under the new guidelines listed above SMCFM accomplished the activities for February and March 2013.

We presented our market study findings at the 2013 Small Farm Conference.

One of our board members, Laura Thomas, attended the 2013 Small Farm Conference and took the Farmers Market Training track.

Our vendor meeting had been moved to the end of March because of inclement weather that occurred on the date of the February meeting. In the interim, we learned that the facility we were using for the market was no longer available to use. Our new meeting was rescheduled for April at the Monongalia extension office.

The SMCFM Board worked to find a new location for the market to continue - Mountaineer Mall was selected. However, no board member was willing to sign the lease with the mall because no individual wanted that level of responsibility. The board met again and it was decided to dissolve the entity known as the South Morgantown Community Farmers Market. During that time it was also learned the church had decided to establish its own farmers market. Community Farmers Market opened at Community UMC in June 2013

Overall, the grant did increase local food awareness and the availability of specialty crop produce in North Central West Virginia. All the vendors that were associated with SMCFM now vend at Community Farmers Market. Customers haven't seen any negative effects from the change of market management.

While SMCFM was a viable market we were on track to accomplish all our goals.

This information is not available because SMCFM is no longer an entity.

## **BENEFICIARIES**

The vendors and customers of the new Community Farmers Market located at Community UMC benefited greatly from this grant. During its existence the SMCFMA worked very hard in the community to raise awareness of specialty crops in North Central WV. SMCFMA was instrumental in developing, managing, organizing and growing the farmers market which was held at Community United Methodist Church. As to the continued growth of the market there is no current data available, since it is now a service project of Community United Methodist Church.

The only quantitative data available was presented on the Annual Performance Report.

## **LESSONS LEARNED**

The specialty crop study that was conducted increased our knowledge of the importance of diversification in the market.

The use of advertising increases market sales

Market activities, education programs, and financial incentives increases vendor revenue.  
Personal lesson learned.

Do NOT apply for any funding unless you have a complete understanding of the complexities of the reporting process.

In retrospect, we had no idea that establishing ourselves as a separate entity by becoming our own association and applying for outside funding would upset the relationship we had with Community United Methodist Church. Initially establishing ourselves separate from the church and seeking outside funding to help grow the Market was originally encouraged by the members of the Board Of trustees. However, in January of 2013, a change in the membership of the Board of Trustees occurred at Community United Methodist Church. SMCFMA was considered a liability and a financial risk by the Board of Trustees at the Church. This led the new Trustees of the Church to no longer be willing to host the Market that was organized by what they now considered an outside group.

Our Goals could not be reached because SMCFMA has dissolved.

### **CONTACT PERSON**

**HR Scott**

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All SMCFMA BOARD MEMBERS HAVE RESIGNED. The market was dissolved under the guidelines that were set in the bylaws of the association.

All market records are being turned over to WVU Monongalia Co extension.

**Applicant: North Central West Virginia Beekeepers Association**

**Project: “Training and Educating Young Beekeepers”**

**Amount Requested: \$3,000.00**

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### **PROJECT SUMMARY**

The specific issue has a dual purpose: first, to educate students in the art and importance of beekeeping, and second, to increase the number of bees to pollinate crops. This does provide an overall economic benefit to West Virginia agriculture and the specialty crops. There needs to be enough bees to have adequate pollinators and to have beekeepers to serve as a first line of defense against the Africanized Honey Bee, which has already invaded eleven southern states.

The project does make good business sense in economic terms. Without bees, valuable crops will not be pollinated. Specialty crops need these pollinators. Also the hive products (honey) can be also harvested as a commodity. The project does have a high likelihood of succeeding in terms of the mentoring with each student to receive the desired results.

This program promotes a positive image of bees, honey and the crops they pollinate. It also contributes to a positive image of West Virginia in dealing with the problems related to beekeeping. It also promotes responsibility. This program will expose many people to the benefits of bees and beekeeping who may otherwise never know about it. This project enhances the experience of new beekeepers and provides encouragement. Students in this program will share what they have done with their peers. This project will help to enhance the capacity for West Virginia to pollinate its own crops. It encourages young people to become involved, and teaches responsibility. It increases an understanding of what can be done with honeybees in the minds of people who may enter other fields of study and work. It promotes the local business infrastructure as more beekeepers purchase equipment and bees from local suppliers. It has the potential to create jobs if any of the students pursue beekeeping on a larger scale.

### **PROJECT APPROACH**

During December 2011 and January 2012, the mentors met with all four students and all but one of the parents to discuss what was expected of the student during this grant period with the help of the mentors. Students, along with some of the parents, started attending the monthly beekeeping club meetings of the North Central West Virginia Beekeepers Association starting in January.

The first of February we received the equipment to start the young men in their beekeeping. On February 11, 2012, we had a Beginners Class for our four students and other attendees. The four beginners of the Grant took home their equipment to get started in putting the hives and frames together and painting them. Also, they were given books and magazine subscriptions to learn more about beekeeping.

The mentors followed up in talking to the new beekeepers in March and April to see if they were ready for their bees that they were to receive at the end of April and first of May.

At the end of each quarter of the year, the students were given 10 questions about beekeeping that they must research in the Beekeeping for Dummies book. The answers were reviewed with their mentors.

The mentors showed the students how to install the nucs that were purchased locally with California produced Wooten Gold Queens. After installation, they were shown how to feed a sugar water solution in their hives until the twenty frames of wax foundation were drawn out and filled with honey and pollen stores. Due to the weather, the scheduled Field Day, which the young beekeepers were expected to attend, had to be cancelled due to the lack of any scheduling dates available. This took them into the month of July. By then, some of the hives needed honey supers added in case of a summer or fall flow of nectar.

In July and August, when the mentors and State Bee Inspector, Joyce Frye, could schedule an inspection date, we inspected all eight hives. She noted that the hives were strong but they had varroa mites and no other diseases. She recommended that the hives be treated. Each grantee was given a copy of the Inspection sheet that Frye filled out and dated.

In August, we had the young beekeepers place sticky boards under the bottom board to count the varroa mite population that was dropping down. After these numbers were collected, some of the mite counts were above 40 mites dropped per day and the mentors decided that they should use Mite-away quick strips to reduce the population of the varroa mites. The mentors demonstrated how to install the strips to three of the new beekeepers; the fourth had parental instruction on the proper way to install the strips and the safety precaution of doing so.

At the August club meeting, we had asked the young beekeepers to attend that meeting and bring their scrapbook and journal to share with the club. Three of the four did attend and bring their books. Two of the grantees got up and gave a short talk on their beekeeping experience this year. At the end of August, all eight hives had plenty of honey and pollen stores to start in the fall and winter seasons.

In September, one of our student's hives died because of robbing, we presume. The students attended our November banquet meeting and gave a short progress report on their beekeeping activities during the past year.

In February of 2013, the beekeepers inspected their hives to see if their hives had enough pollen stores and honey to make it thru the hard months of March and April, when the bees will consume a lot of their stores. During this time period, the same student, who lost a hive in the fall, had his second and last hive die, but did not notify the mentor until weeks later for the mentor to help in decision making for the cause of the death of the hive. Consequently, because his two hives had died, he was unable to complete the project and we reclaimed the equipment from this grantee, because he did not earn his right to keep the hives.

Towards the middle of April, we encouraged the grantees in ways of reversing the hive bodies and seeing that the bees had plenty of room in their hives to keep them from swarming. During this time period, we also had a class on how to use the Snelgrove method, which is used in keeping their hives from swarming, thus keeping their hives full of foraging bees for the possibly good flow starting at the end of April thru the end of June. During this time we encouraged them to put honey supers on each of their hives. At the end of April, we talked to them about how to make splits, if their hives were full of bees, to make increases in their apiary or to sell the nucs for a profit of approximately \$120 a piece.

At this time of the month, we lost our second grantee, as he decided he did not have enough time to manage his bees.

In July, we showed them how to extract any honey they had in their hives so they could keep this for their own use or sale for profit. In August, we encouraged them to check for mite levels in their hives and if need be, use the Mite away quick strips to keep mite population down.

In September, for the grantees and their hives that were still alive, we encouraged them to check to see if they had enough honey stores to survive the winter months, leading into the spring of

2014. It was the role of the mentors to help the students get started in the beekeeping classes, to get them informed about the time line of equipment arrival, packaged bees arrival or anything else that they might need to communicate to the students. It was their job to help them learn to do the beekeeping, not to do it for them. Also the mentors made regular planned visits to help them learn the proper timing for doing the work in beekeeping, and also encouraging the student to attend the meetings of the beekeeping club.

### **GOALS AND OUTCOMES ACHIEVED**

See above about Project Approach

Keeping the bees alive the first year, into the second year and getting surplus honey. Working with the bees independently and realizing what problems could come about and learning how to deal with those problems. Two of the students did complete the two year project successfully.

Two beekeepers accomplished all the goals that were given to them, and more. Two beekeepers did not finish the project because one gave up when he said he did not have the time, due to other obligations and the other beekeepers had his bees die on his watch, which could have evolved due to many factors. This grantee had a lack of communication with his first mentor, resulting in a second mentor having to take over. This grantee was also heavily involved in school, sports and church activities, claiming much of his time and making it difficult for mentors to even check in with him to help him with his hives and we feel this contributed to the lack of attention to his hives, resulting in the death of his two hives.

The third student attended a lot of the meetings with his dad and kept in contact with his mentor. His beehives made it thru the 2 years but because of the location of the hives and nectar flow in his area, his bee hives only made a total of 20 pounds of honey. Some years, in one particular area, you can have a great flow of nectar and other years the flow could be a dearth flow. This 2013 year was bad for the nectar flow in his area.

The fourth and youngest student has done exceptionally well with his hives. In the spring of 2013, he made 2 splits from his 2 original hives resulting in 4 hives. He decided he wanted an increase in his apiary instead of selling those splits for \$150 a piece. He was also given, by the mentor, one complete hive, less bees, in the spring from one of the other students whose bees had died and was forced to quit the project. One of his strong hives made 5 shallow supers of honey and one of his splits made 1 super of honey for a total of 200 lbs. From the sale of his honey he made \$386 at \$14 per quart and \$7.50 per pint. So with the sale of his honey that was extracted and if he had sold his splits then he would have had an income of \$686 for 2013.

This was the second year that he had entered his beekeeping projects in the Doddridge County Fair competitions. He received a blue ribbon both years. His two quarts of honey were auctioned off at the fair for \$175 each and this money of \$350 was donated back to help support

the Doddridge County 4-H show barn. One beehive died out in the early fall of 2013, possibly because it went queenless without the young beekeeper or mentor noticing it until it was too late. So now he still has 3 strong bee hives going into the winter of 2013 and 2014.

The goal was to keep the 2 beehives thru out the period and to collect honey and/or pollen, make splits if possible, and to become a better, smarter, beekeeper by reading the materials that were given to them and by attending the club meetings and gathering information from the speakers and more experienced beekeepers, like their mentors. Two students did not attend a lot of meetings nor were they ready accessible in keeping in touch with their mentors. Possibly because of this, one student dropped out the second year in April 2013, when his beehives were fairly strong. One hive was ready to make a split out of which would have netted him \$100. His beehives were kept the rest of the year and they produced several supers of honey, which the student could have made several hundred dollars from them. His reason for quitting was that he was too busy with the Boy Scouts, which I would have to question somewhat.

### **BENEFICIARIES**

The North Central West Virginia Beekeepers Club members, along with the mentors, have come to realize what it takes to mentor young students over a two year period. We have come to understand what we can do differently in getting people involved and keeping them involved. It takes a lot of commitment from both sides. The local businesses from where supplies were purchased, appreciate the extra business sales. The different people that came in contact with these young beekeepers learned more about beekeeping and how much work is involved in this hobby.

As mentioned above, one of the beekeepers had a successful year financially with the splits and the selling of honey. One of the other beekeepers learned that you can't always have a successful year – but you can still maintain and work with your hives to try for a successful year later.

### **LESSONS LEARNED**

It would make things run a lot smoother if different mentors were provided for each student. This would make the training more proficient. In the future, we, as mentors, think the students should not have the bee hives on their property until the second year of the program. The first year the beehives should be kept at the mentors residence, then see how involved the students are by going to the mentor's home. After the first year, if the mentor sees that the student is involved in the well keeping of the hives, then they can move the hives to their property.

The students should not be given the bee hives and equipment at no cost. We believe if they put up at least a third of the cost, then they would be more likely to take better care of the bees as they have made an investment.

The equipment and hives of bees that the club has acquired from the students that are no longer in this project will be given to the remaining students that are actively participating in the project or will be utilized by the club to benefit other new beekeepers should no other students be available.

Even though we did not have a 100% success rate with the four students, the two students that became beekeepers over that period, have made us proud. A fifty percent ratio of these students staying the course and doing their best is probably near the same ratio of adults starting in beekeeping and staying with it.

We should have foreseen that some of the student hives would not make it thru the season because a big percentage of older beekeepers go thru the same thing. It shows you have to really stay on top of things with your hives thru out the year to be able to manage them properly so they can survive thru that year.

Instead of the club going out into the public and trying to find people who would like to become beekeepers, especially if we supply the equipment for free, maybe we should wait and see who comes to the club and would like to try to become a beekeeper, even though they would have to invest their own money toward the project. They need to understand that it takes a lot of work and time to keep your bees alive and productive.

**CONTACT PERSON**

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**Applicant: Liberty High School**  
**Project: “Future Farmers Market”**  
**Amount Requested: \$15,000.00**

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### **PROJECT SUMMARY**

A fast-growing segment of agriculture is the farmers market, farm-to-school, and niche market areas. Many Ag students do not have an agricultural background and it is necessary to have a hands-on teaching area if they are to learn how to produce garden crops.

As a teacher, it is easy to talk about doing something to students, however, seeing it in action was a problem here at Liberty High School. A garden was established, a temporary high tunnel used, and crops were started in the greenhouse. Students cared for the garden each summer and then sold produce to local consumers as well as the school itself.

### **PROJECT APPROACH**

The idea was for students to learn hands-on how to grow crops and then sell them. Sounds easy enough, but for students who have never done so, it is quite the undertaking. Grant money purchased tillage equipment, which students used to break ground and establish a garden. The horticulture class of 26 students worked to do this. Students also constructed a temporary high tunnel each growing season. The Horticulture classes constructed raised beds. Students used these as starter gardens to see which ones, would carry the project over the summer. Students would receive the money from selling produce at any markets.

Significant contributors include the board of education, maintenance department, local farmers, and the students of Liberty High School.

## **GOALS AND OUTCOMES ACHIEVED**

Students were to be in charge of this project. They had to show responsibility and a desire to make it a success. Students built raised beds using block and moved top soil from one location at the school to the beds. Students established a garden and cared for it. Students also met with the nutrition coordinator and made a plan to grow potatoes for Raleigh County Schools.

A market was established for students to sell their produce and students made banners as well as signs for the market.

The initial goals of participation were high. Students have so many things to do that being a farmer is way down their list. 5 Students worked each summer to raise the garden. Rain and other problems kept the garden from being planted early the first season and hurt the market. All produce was sold to local business due to the wet weather in June of 2013. Replanting for an extended season was impossible and selling only tomatoes at a farmers' market is not good marketing.

5 students set up a market in the summer of 2014 and sold all produce raised. The potatoes are planned as part of the Farm to School initiative. Next season we plan to grow more and sell to Raleigh County Schools.

The first goal of having 10 students participate in the Future Famers' Market was achieved. 11 students worked throughout the summer and sold items at markets. Gross sales were not as high as planned due to a wet summer keeping them from replanting as needed. A permanent high tunnel will help with this for the summer of 2015.

The Food and Culture classes at LHS have had 5 different teachers and long-term substitutes making the chef's garden and dinners impossible.

## **BENEFICIARIES**

Many groups have benefited from these projects. First off the Ag program has grown because students enjoy all the hands-on opportunities this provides. Not only do they learn about production agriculture in class, they can apply these skills at school and hopefully at home in the future.

The community benefits by having a market closer than the trip to Beckley. This has impacted about 20 people annually.

Faculty and staff at LHS benefit by having the opportunity for joint teaching ventures. Faculty of 4 teachers and classes of up to 80 students.

Raleigh county school benefits by having a class to participate in the Farm to School initiative.

Students sold over \$3000 worth of produce to the community of Glen Daniel each year. Two other teachers used the garden as a teaching tool for their classes. The Beckley uptown farmer's

market is miles from LHS. This greatly reduces the need for travel to a farmer's market for community members.

The potential economic impact can be great. This year Raleigh Co School has access to the Old ARS Research Farm. Plans are in the making for a large undertaking for Farm to School.

Items to be sold to Raleigh County Schools under the Farm to School initiative will be potatoes that are in storage as this report is being completed.

### **LESSONS LEARNED**

Many lessons have been learned from this project, both positive and negative. Lofty goals have diminished as to the level of participation declined. During the school year, students are excited to be involved, however once summer arrived it was difficult to get students to school for work and sales.

It was very positive to see students at work on their own to come to school on a summer evening and find students already working in the garden.

The temporary high tunnel was a great idea in theory. Students purchased all material from a local hardware store. The plan was that any student could construct the same high tunnel at home with minimal input. The plastic uprights cracked and broke. They then, ruined the greenhouse plastic. Because delays from the local hardware store and problems with construction of the greenhouse, the season extension was minimal. Students definitely learned how not to build a high tunnel. We have obtained other funding and are working now to build a permanent one.

Goals may have been lofty originally yet the project went well. Classes have grown at liberty to over 60 students this semester, which potentially puts the program exceeding 120 students by the end of this school year. This is a single-teacher department. We have money to now build a permanent high-tunnel which should greatly improve this overall project.

### **CONTACT PERSON**

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**Applicant: West Virginia University Research Corporation**

**Project: “Management of Brown Marmorated Stink Bugs on Specialty Crops in West Virginia”**

**Amount Requested: \$24,835.00**

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### **PROJECT SUMMARY**

The project was conducted in 2011-2014 to develop integrated pest management (IPM) strategies for growers to manage BMSB on specialty crops in West Virginia.

The brown marmorated stink bug (BMSB), *Halyomorpha halys* Stål (Hemiptera: Pentatomidae), is an invasive insect pest native to eastern Asia. In the United States, BMSB was first reported in Allentown, PA in 1990s where it was reported as a household and ornamental pest. However, BMSB has become a major agricultural pest throughout the Mid-Atlantic States during the last eight years. BMSB feeds on a wide range of host plants and almost any crop with fruit can be at risk with the presence of BMSB. Specialty crops at risk include fruits (e.g. apple, peach, pear, and berries) and vegetables (e.g. tomato, pepper, and cucurbits). Since BMSB was confirmed in West Virginia in 2004, BMSB continues to disperse throughout the state. Before this project started in 2011, BMSB distribution and risk in West Virginia was largely unknown except a couple of counties where economic damage in tree fruit orchards was reported before 2011; these counties included Berkeley and Jefferson counties.

Although recent efforts on controlling BMSB using insecticides, traps, and natural enemies introduced from Asian countries have shown some potentials for BMSB control, considerable economic losses by BMSB are still reported in most of specialty crops including fruits and vegetables. BMSB continues to expand its geographic range, and it is likely to invade most agricultural areas in West Virginia causing considerable economic damage on specialty crops. Without intervention upon the BMSB outbreak and spread, almost any crop with fruit can be at risk with the presence of BMSB. Unfortunately, currently available insecticides do not always provide necessary control against BMSB and there were no alternate control measures such as natural enemies. In addition, distribution and risk by BMSB in West Virginia was largely unknown or not well reported. To address these questions and solutions, we conducted timely important research and outreach programs needed for specialty-crop protection against BMSB in West Virginia. Objectives of this project were (1) statewide survey to assess risk and generate distribution maps of BMSB in West Virginia, (2) utilization of native natural enemies, such as soldier bugs, for biological control of BMSB, and (3) development of BMSB outreach and education programs for various clientele including specialty-crop growers/industry, state employees including extension agents, and home gardeners.

### **PROJECT APPROACH**

To achieve the goals and objectives, three major activities were conducted: (1) statewide survey of BMSB, (2) survey and research on natural enemies of BMSB in West Virginia, and (3) education for grower and agricultural professionals through outreach.

**Statewide BMSB Survey.** A Statewide survey for determining BMSB presence and its infestation levels was conducted in 2011-2014 by visiting all the 55 counties of West Virginia. The survey data were entered to build a spatial database using geographic information system (GIS), which compiled data and generated BMSB distribution maps. From the survey we found BMSB in 52 of 55 counties by the end of 2013 (Fig. 1). As of September 2014, the presence of BMSB has been confirmed in all the West Virginia counties except Pocahontas and Pendleton

counties. In terms of risk of BMSB in West Virginia, high infestations of BMSB that can cause considerable economic damage on specialty crop were found in four counties of West Virginia including Berkeley, Jefferson, Monongalia, and Moran counties. The average numbers of BMSB were  $127.3 \pm 63.12$  BMSB per fruit tree (e.g. apple and peach) and  $18.2 \pm 9.63$  per vegetable (e.g. tomato and okra) in the counties.

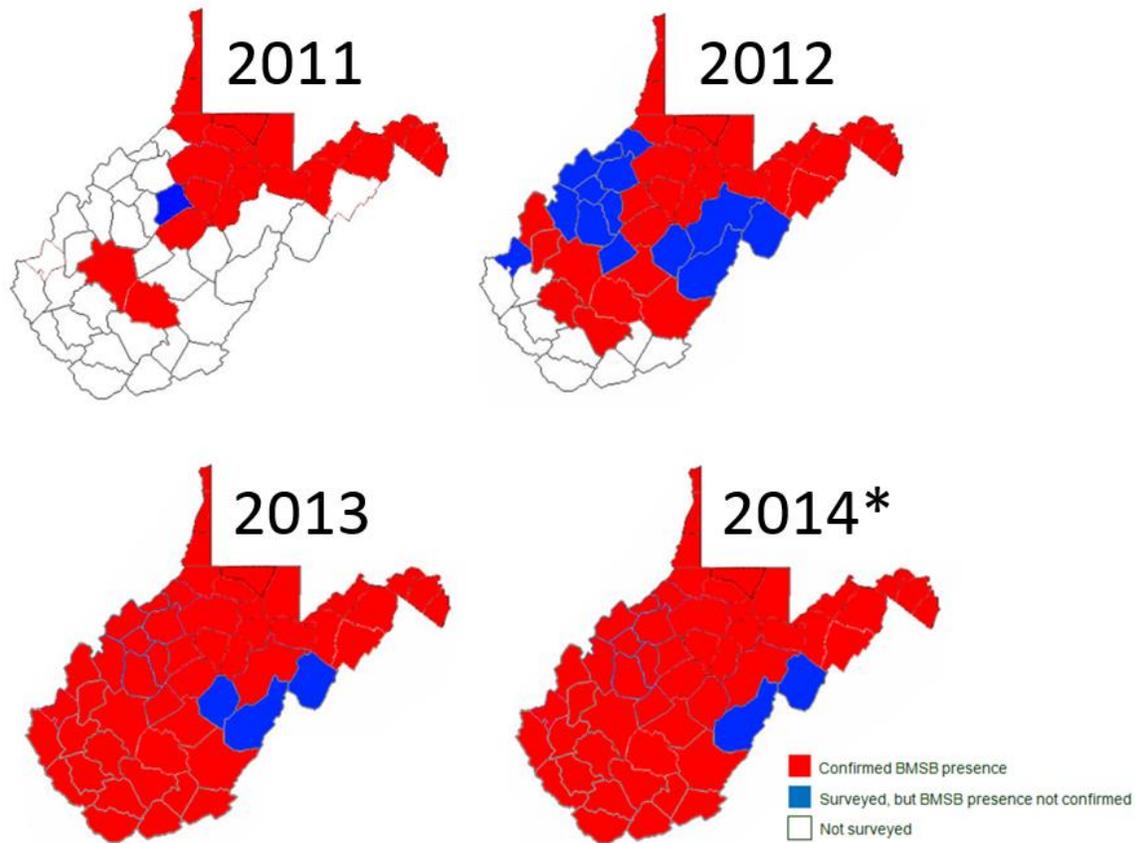


Fig. 1. Results of the statewide survey of BMSB conducted in 2010-2014 in West Virginia. \* indicates the distribution of BMSB as of September 2014.

**Research on Natural Enemies of BMSB.** Various field and laboratory experiments were conducted on the WVU Organic Research Farms and WVU Entomology Laboratory to investigate the potential of using natural enemies to control BMSB. The spined soldier bug, *Podisus maculiventris* (Hemiptera: Pentatomidae) (Fig. 2), showed a high rate of predation on various stages of BMSB, suggesting a potential predator for BMSB control. In addition, we have been successful to mass rear the spined soldier bug in the laboratory using mealworms as an alternate food source. Because the price of the spined soldier bug is very high (i.e. \$3 per bug), a mass rearing and production of spined soldier bugs are necessary. Currently, WVU Entomology Laboratory is rearing approximately 2,000 spined soldier bugs in the colony.



Fig. 2. A spined soldier bug nymph feeding on BMSB eggs (A) and an adult spined soldier bug (B, insect on the left) attacking BMSB adult (B, insect on the right)

We have surveyed natural enemies of BMSB throughout West Virginia along with the statewide BMSB survey (objective 1). We found four different species of natural enemies that can effectively feed on eggs and immature BMSB. They are anchor stink bug (*Stiretrus anchorago*), ambush bug (*Phymata* spp.), minute pirate bug (*Orius* spp.), and spined soldier bug (*Podisus maculiventris*). Among them, spined soldier bugs were most commonly found in West Virginia.

We also conducted a laboratory study to determine the effect of three major organic pesticides on soldier bugs. Three organic insecticides (Pyganic®, Azera®, and insecticidal soup) were selected and tested with 100 soldier bug adults for each pesticide. We found that all the organic pesticides used in this study caused high mortality of soldier bugs. When the pesticides were directly applied to soldier bugs, insecticidal soup caused 100% mortality while Pyganic and Azera caused ca. 50% mortality of soldier bugs when low concentration of pesticides were applied (Fig. 3). When residues of the pesticides were tested with soldier bugs, Pyganic showed higher mortality (ca. 80%) compared to Azera (20%) and insecticidal soap (35%).

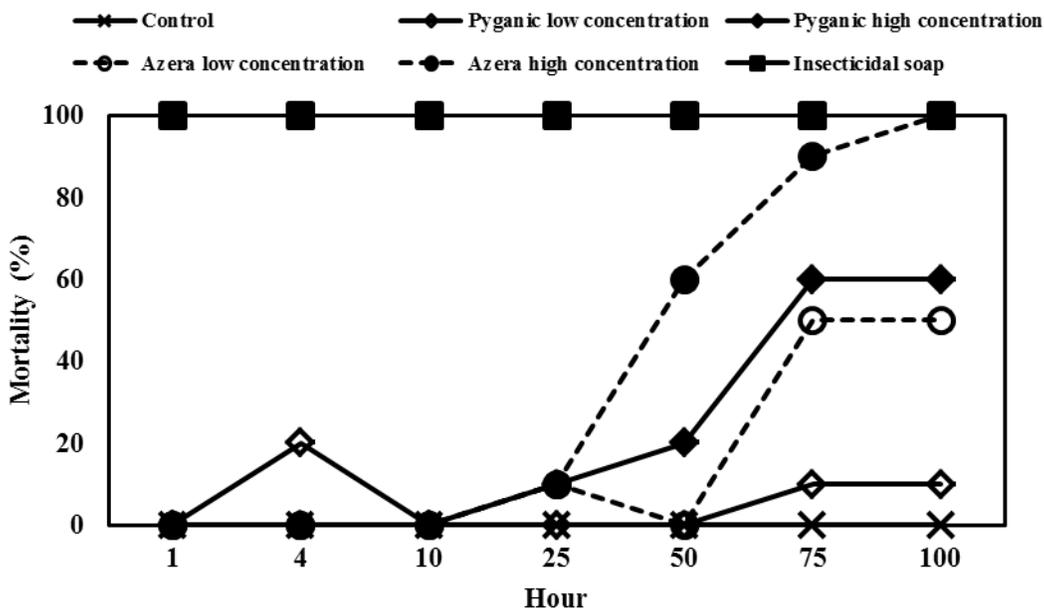
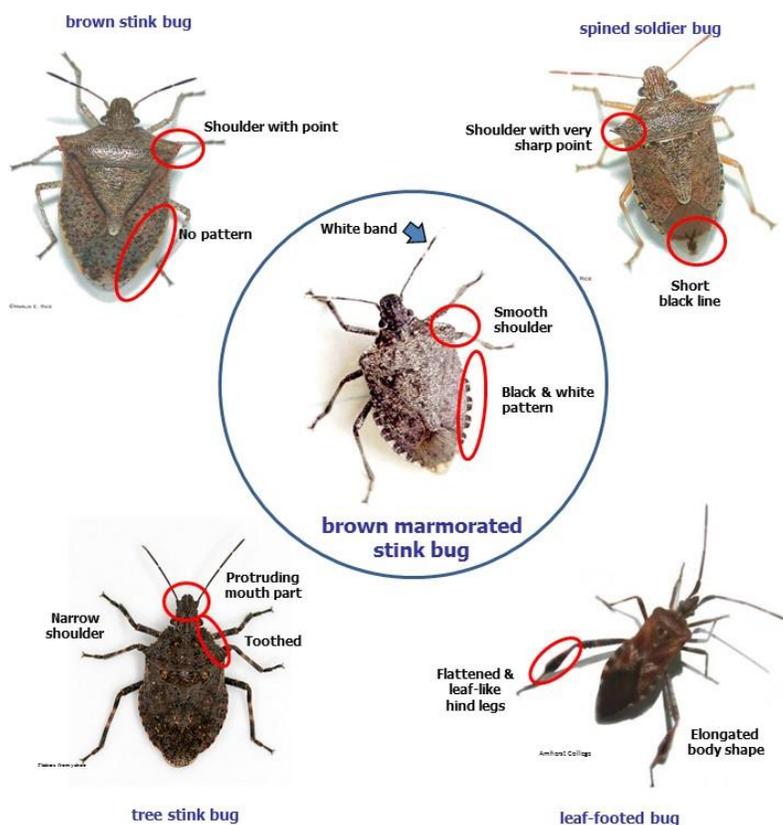


Fig. 3. Effect of three pesticides used in organic farming on motility of the spined soldier bug, a natural enemy of BMSB

**Education through outreach.** Educational materials have been developed according to the need of various clientele. The educational materials include documents for how to identify BMSB and specimens of BMSB and other stink bugs (see Fig. 4 for an example educational material used for outreach). General information about BMSB can be found on the WVU Extension Service web site.

Developed educational materials and contents were presented at the WVU Organic Farm Field Day each year. In 2011-2014, a total of 50-100 growers, extension agents, and public attended the field day each year. During the field day, a series of workshops and field demonstrations related to BMSB management have been provided for educational outreach for public and specialty-crop industry. The workshop included how to identify BMSB, how to monitor and manage BMSB, and demonstration of on-farm movement of BMSB.

## Brown Marmorated Stink Bug and Similar Species



Prepared by Entomology Program, Division of Plant and Soil Sciences, West Virginia University

Fig. 4. An example educational/outreach material for explaining how to distinguish BMSB from other insects that are similar to BMSB. Various versions of this document have been disseminated throughout West Virginia via workshops, media, and education.

This project was an integrated research and educational outreach project with multiple collaborators from West Virginia University (WVU) including the Division of Plant and Soil Sciences and WVU Extension Service. In this project, six key persons conducted the research and outreach including Dr. Park (PI, Entomologist), Dr. Chandran (Co-PI, WV State IPM Coordinator), Ms. Kondo (Collaborator, Outreach Specialist), graduate students (Mr. Goldner, Mr. Moredock, and Mr. McKinney). Other project participants include County Extension agents, growers, WVU Organic Farm manager and workers, and undergraduate interns at WVU.

Dr. Park was the principal investigator of the project and he led the project. He has provided recommendation for BMSB management throughout West Virginia via extension workshops, field days, and media interviews. In addition to providing overall supervision of the project, he conducted sampling and spatial analysis for BMSB mapping. Dr. Chandran, a Co-PI of this project, was involved in the statewide BMSB survey by recruiting county extension agents to help the survey. As the State IPM Coordinator of West Virginia, he helped disseminate the results of the project and education materials developed from the project. County extension agents helped the survey by identifying survey sites in their counties and guiding the survey team

to the sites. Ms. Kondo is entomology staff with extensive experience in insect rearing and entomological outreach. In this project, she helped rearing a key natural enemy of BMSB, the spined soldier bug, and developing education materials for various clientele. Three graduate students at WVU helped the project by participating in the statewide survey of BMSB and natural enemies in West Virginia each year.

**GOALS AND OUTCOMES ACHIEVED**

We proposed two goals in this project: enhancing adoption of IPM strategy using natural enemies of BMSB (goal 1) and increase awareness of BMSB affecting specialty-crop production in West Virginia (goal 2). No benchmark or baseline date were set to compare because there were no available data associated with risk by BMSB and no sustainable ways to control BMSB using natural enemies. However, we set our performance target and measure and performance measure for the project. To achieve the goals, we conducted 4-year statewide BMSB survey and research on natural enemies of BMSB. We have identified a major natural enemy species (i.e. the spined soldier bug) and we were able to develop mass rearing method. Furthermore, we have tested the effect of insecticide on the natural enemy, which we over-accomplished compared to our performance target. Direct comparison of actual accomplishments with the goals established is listed in a table below.

Goals	Target (from proposal)	Accomplishment
Goal 1: Enhancing adoption of IPM strategy using natural enemies of BMSB	The results of research will be disseminated at two field days/workshops at WVU Organic Farm and Joint WV-VA Tree Fruit School during the project period where 50-70 growers generally attend for each meeting.	We provided four workshops and four field demonstrations associated BMSB through Field Days/On-Farm Workshops in four years (2011-2014) at WVU. These events served >300 people including growers, extension, and agricultural professionals. Also, results of the research were presented six times at the professional conferences and published with six journal articles (see Additional Information section).
Goal 2: Increase awareness of BMSB affecting specialty-crop production in WV	The results of research will be disseminated to agricultural educationists including extension agents and specialists at annual WVU Extension meetings.	To increase the awareness of BMSB we have visited or directly contacted more than 25 growers in West Virginia. Information on BMSB was created in WVU Extension web site and our research results were highlighted in seven media interviews including newspapers and online media (see Additional Information section). Also, regarding BMSB problem and management, we were contacted by >100 people including growers, extension agents, Master Gardeners, and students through

		phone calls, their visits, and our outreach program including WVU Insect Zoo. We have provided information and service to the clientele.
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**BENEFICIARIES**

The primary beneficiary of this project included all growers and industry who produce and process specialty crops. This project benefits the primary beneficiary at least three ways. First, the output of this project provided assessment and updates of risk by BMSB for various clientele to prepare, prevent, or minimize BMSB damage. Second, calendar-based chemical control is widely used by growers to control BMSB. This project identified a biological control method against BMSB as a supplemental control measure. Specifically, biological control is urgently needed for organic specialty-crop growers. Third, this project provided educational outreach for various clientele to teach how to deal with the BMSB on specialty crops. This can benefit the secondary beneficiaries of this project including public and home gardeners growing specialty crops. BMSB overwinters as adult stage inside structures such as houses, barns, and buildings, causing a nuisance to residents during winter and damaging gardening crops during summer. Thus, the educational outreach program increased public awareness of BMSB.

BMSB has a wide range of hosts, and major specialty crops prone to BMSB damage in West Virginia include fruit trees (e.g. apple, cherry, grape, peach, pear, and various berries) and vegetables (e.g. asparagus, dry bean, sweet potato, tomato, and various cucurbits). According to National Agricultural Statistics Service, the primary beneficiaries of this project run 2,210 acres of 726 vegetable farms and 6,909 acres of 613 orchards in West Virginia. These clientele are directly benefited from the outcome of the research and outreach programs. In addition, there are 44 certified organic farms in West Virginia and organic growers benefited most with the biological control because there have been no good methods to organically control BMSB.

**LESSONS LEARNED**

From this project, we learned four major lessons which can be helpful for other states and specialty crop stakeholders in the implementation of similar activities. First, we learned that BMSB has invaded 53 of 55 West Virginia counties. During the survey, we spotted BMSB in many counties of neighboring states including Ohio, Pennsylvania, Virginia, and Kentucky. These states may use our survey results for their implementation of BMSB survey. Second, our survey revealed that West Virginia already has an important natural enemy (i.e. spined soldier bug) against BMSB. Third, we learned that human resources for managing noxious invasive insect pests such as BMSB are very limited in West Virginia. The key problem we identified was the shortage of county extension agents. West Virginia has 55 counties but has only 35 county extension agents; some agents cover multiple counties. This caused difficulties in the early phase of the project. Also, this can be a big hurdle in terms of disseminating timely important information and knowledge to growers in West Virginia. Fourth, the economic status and education level of West Virginia citizens in southwestern part of state was very low. Many growers and citizens were not aware of the potential of economic problems associated with BMSB. This has been a big challenge for this project.

No major problems or delays occurred during the project period except that a project modification which was requested to the West Virginia Specialty Block Grant Program and USDA Agricultural Marketing Service. The modification we requested was change in budget for pheromone traps because BMSB aggregation pheromone was identified by USDA researcher, but had not been commercialized before this project ended. So, the request was made to change BMSB survey by pheromone trap to visual survey of BMSB. This request was approved on April 19, 2013 by Mr. John Miklozek at USDA Agricultural Marketing Service. With commercialization of the aggregation pheromone by USDA, researchers, extension agents, growers and other stakeholders will have a better way of monitoring and managing BMSB.

### **CONTACT PERSON**

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### **ADDITIONAL INFORMATION**

Here are lists of scientific publications, presentations, and highlights in media generated during the project period. Also, some photos are included at the end.

#### ***Publications***

- Baek, S., Y. Son, and Y.-L. Park. 2014. Temperature-dependent development and survival of *Podisus maculiventris* (Hemiptera: Pentatomidae): implications for mass rearing and biological control. *Journal of Pest Science* 87: 331-340.
- Gyawaly, S. and Y.-L. Park. 2013. Feeding Potential and Prey Acceptance of *Podisus maculiventris* (Hemiptera: Pentatomidae): Implications for Biological Pest Control. *Journal of Plant Biology and Soil Health* 1: 5.
- Park, Y.-L., and M. M. McKinney, S. Baek, and V. Kondo. 2012. Effects of pesticides on brown marmorated stink bugs. *Pennsylvania Fruit News* 91: 1-4.
- Biggs, A. R. and Y.-L. Park. 2012. Control of overwintering adult brown marmorated stink bug injury on John Boy peaches, 2011. *Arthropod Management Tests*. 37: B9.
- Biggs, A. R. and Y.-L. Park. 2012. Control of overwintering adult brown marmorated stink bug injury on Gala and Ginger Gold apples, 2011. *Arthropod Management Tests*. 37: A2.
- Biggs, A. R. and Y.-L. Park. 2012. Effect of Asana, Vydate, Brigade + Altacor, and four concentrations of Lannate on brown marmorated stink bug adults and nymphs, 2011. *Arthropod Management Tests*. 37: B10.

#### ***Presentations***

- Moredock, J. T. and Y.-L. Park. 2014. Biological Control of Brown Marmorated Stink Bug (*Halyomorpha halys*) Using Spined Soldier Bug (*Podisus maculiventris*). Symposium for Summer Undergraduate Research Experience. West Virginia University, Morgantown, West Virginia.
- Park, Y.-L. 2013. Collaborative Pest Survey in West Virginia. West Virginia Entomological Society Annual Meeting. North Bend State Park, West Virginia.

- Baek, S., Y. Son, and Y.-L. Park. 2013. Modeling temperature-dependent development and survival of *Podisus maculiventris* (Hemiptera: Pentatomidae): Implications for biological control. Eastern Branch Entomological Society of America Annual Meeting. Lancaster, PA.
- Goldner, J., and Y.-L. Park. 2013. Assessment of spined soldier bug (Hemiptera: Pentatomidae) as a predator of brown marmorated stink bug (Hemiptera: Pentatomidae). National Entomological Society of America Annual Meeting. Austin, TX.
- Baek, S., M. I. McKinney, J. Goldner, C. Park, B. Seo, and Y.-L. Park. 2013. Non-target effects of organic insecticides on *Podisus maculiventris* (Hemiptera: Pentatomidae). National Entomological Society of America Annual Meeting. Austin, TX.
- Park, Y.-L. 2013. Whole-farm movement of brown marmorated stink bugs. Brown Marmorated Stink Bug Working Group meeting. Vineland, NJ.
- Park, Y.-L. 2011. On-farm movement of brown marmorated stink bugs. OREI Brown Marmorated Stink Bug Group Meeting. Beltsville, Maryland.

### ***Media Interviews***

- “Stink bug invasion not like Beatlemania” appeared in Herald Standard (January 2014)
- “Causing a Stink” appeared in Dominion Post (July 2014)
- “Bugged Out” appeared in Dominion Post and You Tube (July 2014)
- “More researchers join effort to control stink bugs organically” by Mother Nature Network (December 2012).
- “WVU helps search for organic response to smelly, destructive bug” by The Charleston Gazette (November 2011).
- “WVU helps search for organic response to smelly, destructive bug” by The Charleston Gazette (December 2012).
- “Stink Bugs and You” by Gardening News (November 2011).

### ***Some Photographs Related to Project***



Fig. 5. Overwintering BMSB inside farm structure such as barn, greenhouse, and shed on a cooperating grower's farm. Many overwintering BMSB were found inside package boxes (A), cracks and crevices, and even on clothes (B). These overwintering BMSB are the major source of population that causes crop damage during the following cropping season.



Fig. 6. Workshop on BMSB during a field day with growers and extension agents (A) and a graduate student preparing for a field demonstration about how to monitor BMSB and use the spined soldier bug to control BMSB (B).



Fig. 6. A BMSB nymph fed and killed by the spined soldier bugs (left) and normal healthy BMSB nymph (right). We found in this project that spined soldier bugs can effectively kill eggs and nymphs of BMSB.

**Project: “New Homes for the Honeybees”**  
**Amount Requested: \$5,000.00**

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**PROJECT SUMMARY:**

This project provided a variety of fruit trees, brambles, and other small fruits to West Central Beekeepers Association members throughout a multi-county area of West Virginia (Calhoun, Gilmer, Roane, and Wirt Counties) to create a healthier honeybee population and stable food source. The anticipated fruit production benefited the area by increasing viable pollen and nectar for the honeybees, potential food, and income for area growers. Plants were distributed to members and individuals who attend classes through a cost-share system. Fruit production education was conducted in collaboration with the local WVU Extension Service and our beekeepers club. Previous SCBGP-funded projects trained beekeepers on hive management and provided cost-sharing of package bees to establish higher honeybee populations in our area. This project complimented our previous efforts by increasing food sources, thus improving winter survival rates of honeybee colonies and developing fruit plantings for increased specialty crop consumption and sales in the area.

**PROJECT APPROACH:**

In January 2012, a beginning beekeepers class was sponsored by the West Central Beekeepers Association, which concluded with small fruits and fruit tree planting classes provided by Brandy Brabham and Daisy Fryman, both WVU Extension Agents, and Dave Sheppard of Happy Bee Supply, speaking on nectar source locations, giving a total of 6 hours of training in 2012. A variety of fruit trees, brambles, grapes and other small fruits were ordered in the fall of 2011 for spring 2012, based on hardiness recommendations from Extension specialists and a local nursery owner, Simms Greenhouses and Water Gardens. Cost-sharing was provided to 45 project participants for a total of 533 fruit bearing trees & small fruit plants from the local nursery in 2012.

Throughout 2012, participants planted the fruits, monitored plant growth and health of honeybee colonies, and assess survival rates. In October 2012, an additional 245 trees and plants were ordered through fundraising and cost-sharing efforts. This was a favorable development, because participants in the project wanted to add more plantings and were willing to participate in additional fund-raising efforts to offer more cost-share opportunities to landowners in our region. In the spring of 2013, these additional plants were delivered and planted. Daisy Fryman Bailey, WVU Extension Agent from Calhoun County taught planting instructions and disease control. Brandy Brabham, WVU Extension Agent from Roane County presented a seminar on pruning, feeding and annual care of our plants. Dale Cunningham, President of WCBA and David Tatterson, member, assisted in some hands-on instruction on planting techniques for an additional 6 hours of training we had planned for this project.

Specialty Crop Block Grant funds were not used to pay for fundraising activities. Our fund raising activities are wholly and separately supported through our general funds, with no grant funds being used for that purpose. Our association has a private auction once a year, open to members only, of items donated within our club membership.

In addition to that, we charge a membership fee, as well as a small fee for classes, which helps support our cost sharing and educational programs. For those members who purchased items through our grant program, a portion is refunded to assist in the cost of purchases. Additional fund raising activities include the sale of raffle tickets for items that are purchased for that sole purpose and paid for from our general funds.

Referring to documentation of planting sites, Dale Cunningham, President of WCBA, visited several sites while unofficially assisting Wade Stiltner, State Apiarist/Bee Inspector, with hive inspections. This tree planting venture benefited all of our WCBA members, even those who chose not to make plant purchases, as they attended the educational classes, as to planting, maintaining and disease control, which were provided through WVU Extension agents.

Further, questionnaires were provided to participating members at six month intervals after plantings, as to the survival rates, and success of the two year grant program.

Any mention, in previous documents, of additional purchases or plantings, or fund raising events, was done so, ONLY as an indication of our efforts as a beekeeping association, to help our beekeepers be successful.

Some of our club officers and members shared our successes at public events, such as the WV State Honey Festival in Parkersburg, attended the Honeybee Expo in Parkersburg to gain additional knowledge, and set up public educational displays at the WV Black Walnut Festival in Spencer, WV. Additional outreach educational seminars were presented at local schools and community events including Reedy Elementary in Roane County, Arnoldsburg Elementary, and Pleasant Hill School in Calhoun County and the Heritage Day event in Wirt County.

#### **GOALS AND OUTCOMES ACHIEVED:**

Our basic goals were met, having distributed and planted fruit trees and small fruits throughout a multi-county area of West Virginia (Calhoun, Gilmer, Roane, Wirt Counties), by 45 participating members who completed the 12 hours of training, which also resulted in a total of 778 fruit bearing trees & small fruits being planted in the region. The dry weather of 2012 summer months was problematic and the wet weather of 2013 was not conducive to honeybee health and production.

Our goals to increase the winter survival rate of the honeybee colonies and general health of the honeybee population as a result of creating healthier environment through more viable and readily accessible food sources and increase the availability of fruit for home consumption and sales through increased plantings and improved pollination are more long term. We also planted approximately 85 deciduous trees at the Calhoun County Park in Grantsville, WV in cooperation with Division of Forestry under their "Our Tree-ways Programs." We have planted 533 fruit trees and small fruit plants in the spring of 2012 and another 245 plants in the spring of 2013.

Questionnaires were presented to our members at the 2013 September beekeepers club meeting as to the survival rate of the honeybee colonies and fruit plantings, which showed an 85% survival rate of the plantings. But, on the honeybee survival rates, we noted a sharp decline

from 75% to 60% when comparing the 2012 season to the 2013 season, which we attribute more to the wet spring of 2013 rather than our fruit planting project. The long-term impact on sales and consumption will be measured from the local farmers' market sales and variety of fruits offered and participant feedback. Baseline data collected from surveying six local farmers' market managers in the region, which represents about 29 regular vendors, revealed sales of a total \$25,000 for the 2011 season, while the 2013 had \$39,000 in sales from 37 regular vendors total at the six regional markets. Site visits revealed no significant changes in fruit offering over the last two year. However, it was noted that the wet growing season of 2013 provided much more volume and bigger-sized local tree fruits, mainly apples and pears at the markets.

### **BENEFICIARIES:**

Area beekeepers benefited and will continue to benefit from the 85% survival of 778 fruit plantings in the way of availability of the food sources for the honeybees and fruits for sales or consumption. Specifically, 45 beekeepers benefited from the 12 hours of training on fruit planting, care, pruning, and disease control. Approximately 47 actual orders, as this was a 2 year split, and some of the ordering members were repeat orders, a rough estimate of benefiting beekeepers was about 45. In addition, any beekeeper located in the area of our plantings would benefit from the pollen sources which were created through our program. The area farmers, landowners, and wildlife benefit from the pollination provided by healthy honeybees. Six regional farmers markets and local honey customers benefited from the increase in honey and fruit availability, a local nursery benefited from the sales of the fruit plants. The local schools and communities benefited from the outreach services that the beekeepers association is able to provide as a result of the support they have received through this project to ensure that the honeybee populations are maintained and thrive.

### **LESSONS LEARNED:**

Project staff gained many insights while completing this project. We learned that Census of Agriculture data didn't disclose the value of sales data for the fruits, berries, and tree nuts. Regional farmers markets struggle to maintain vendors, customers, and sales data. Honeybees are very dependent on beekeepers to sustain a healthy colony. Education did improve the care of honeybees and fruit plantings. Fruit varieties played an important role in survival rates. When cost-sharing opportunities are provided more participants are eager to assist with research, fundraising and outreach efforts. Survival rates of honeybees were hard to measure based on just one factor (fruit plantings). Lastly, more time would be needed to collect sales/consumption data for to demonstrate long-term impacts of fruit plantings.

### **CONTACT PERSON:**

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**Pioneer Days, Elizabeth**



### School Seminar



**Applicant: West Virginia Christmas Tree Growers Association**  
**Project: *“Increasing the Number of Christmas Tree Farms in West Virginia”***  
**Amount Requested: \$10,000.00**

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The project was developed by the West Virginia Christmas Tree Growers Association (WVCTGA) to address the continuing loss of Christmas tree farms in West Virginia (WV). About forty percent of WV counties do not have an operating Christmas tree farm.

In the past twenty years, the number of Christmas tree farms has continued to decline. Fewer than one hundred tree farms remain and several of these are no longer planting trees.

## **PROJECT APPROACH**

The project was approved in December 2011. The project financed twelve regional workshops throughout the State. A computer and printer were purchased to provide promotional and educational handout materials for the workshops. Additionally, a website was established to keep potential growers aware of important current information, to effectively address any problems and also to possibly reach others interested in growing trees.

One major outgrowth of this effort was the approval of the WVCTGA Board of Directors to award a one-year membership to all workshop attendees who were planning to start a Christmas tree growing business. They received all member benefits including the WVCTGA newsletter that is published six times per year.

The twelve workshops were completed. A written outline of the entire Christmas tree growing process was prepared. This included a detailed Cost/Income Analysis, for a small “Choose and Cut” tree farm. The outline was provided to all workshop attendees. The workshops were all conducted at an operating Christmas tree farm. A Two-hour seminar covered all aspects of growing Christmas trees, from site selection to marketing. Each seminar was followed by a farm tour where management activities were explained and practices necessary to grow high quality trees were demonstrated.

During the course of offering the workshops, substantial savings incurred due largely to contributions of partner organizations assisting with publicity and promotion. Another large savings occurred due to the provision of sanitary facilities by the workshop hosts. Portable sanitary facility was only needed to be furnished at one workshop site.

With over half of the grant funds remaining, the WVCTGA Board of Directors voted to request alterations to the project by conducting a workshop for professional forestry and natural resource workers. Upon approval by grant administrators, the workshop was conducted in early September 2014, with seven professionals in attendance.

The WVCTGA Board also requested that remaining funds be used to publish a manual, “Growing Christmas Trees in West Virginia”. Grant administrators also approved this revision to the grant. The manual, written by A. Edwin Grafton, with assistance from Willa Grafton, Gilbert “Gene” Bailey, and Dr. David McGill, included a gallery of appropriate photographs. The manual (2,200 copies) was published by the Communication Division of the WV Department of Agriculture.

The manual will be distributed to working professionals throughout WV to provide copies to any potential grower. Copies will also be provided to media outlets and others that may be in a position to promote the Christmas tree industry, such as college and high school forestry programs, FFA and 4-H leaders.

## **GOALS AND OUTCOMES ACHIEVED**

Thirty-six farm owners and seven natural resource professionals attended the workshops. A sign-up sheet provided contact information.

Two workshops were held jointly with the Woodland Owners Association (WOA). The morning program was woodland management given by WOA and the afternoon was solely for the WVCTGA workshops. Twenty-seven persons stayed for these workshops, however, none provided contact information for continued contact. Apparently they attended for the WOA woodland management and stayed for the WVCTGA workshop out of courtesy.

Attendees indicating they were undertaking a tree growing operation were given a one-year membership to the WVCTGA. This enabled the Association continued contact information to provide assistance to any prospective growers. Of the total attendees, currently nine of the farm owners have undertaken a tree growing operation.

Follow-up telephone or personal contacts were made with the other nine attendees. They will receive the WVCTGA newsletter. Six of these have planted or plan to plant trees by the summer of 2015. Only one new county was added to the roster of WVCTGA member farms. There are 74 WVCTGA operating farms in WV. The definite addition of 6 new ones represents an increase of eight percent.

The WVCTGA website, established through this grant is operational and allows the rapid exchange of information among growers.

As a result of savings a manual, "Growing Christmas Trees in West Virginia", is available to potential growers and professionals who wish to promote the industry.

## **BENEFICIARIES**

Clearly, the beneficiaries are multiple. First the Christmas tree shoppers will have additional locations to purchase locally grown trees. Secondly, a manual is available, hereby replacing a 1960's publication to provide prospective growers with current information necessary to undertake a Christmas tree business. Thirdly, the WVCTGA has gained some new members. Fourth, the WVCTGA has a website for better communication among growers and the public.

About 500 copies of the manual produced through this grant have been provided to professionals working for the State Division of Forestry, Natural Resource Conservation Services, Farm Service Agency and University Extension Services. Additionally WVCTGA were provided multiple copies for distribution in their areas. The WOA, WV Forestry Association and schools with Vocational Agriculture programs have been provided copies.

## **LESSONS LEARNED**

All goals were achieved although attendance at workshops was less than expected. However, the publications of the manual "Growing Christmas Trees in West Virginia" will support continuing efforts to increase the number of growers in the State.

Promotion of the workshops was largely through local newspapers and newsletters of the Farm Bureau, Vo-Ag programs, WOA, and the WV Forestry Association. Announcements were also provided to almost all government agriculture/forestry agencies and vocational education groups such as FFA. Promotion of the workshops was best reached through internet connections and via social media. Newspaper advertisements reached very little attendees.

## **CONTACT PERSON**

The contact person for this project is A. Edwin Grafton, 130 Berry Fork Road, Heaters, WV 26627-8012. The contact telephone number is 304-765-3014 and email address is: [willag@me.com](mailto:willag@me.com)

## **ADDITIONAL INFORMATION**

The website address is: [www.wvchristmastreegrowers.com](http://www.wvchristmastreegrowers.com)

Copies of the manual "Growing Christmas Trees in West Virginia", can be obtained by sending a request to: [willag@me.com](mailto:willag@me.com)

**Applicant: Arnettsville Community Association**  
**Project: “Sharing the Bounty Incubator”**  
**Amount Requested: \$10,000.00**

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### **PROJECT SUMMARY**

This project focused on building the capacity of growers in our area to launch and sustain a specialty crops farmers’ market at the Arnettsville Community Center. One goal was to increase access to healthy food options in our rural area – located roughly 10 miles from the center of Morgantown and nine miles from the center of Fairmont. A second goal was to expand marketing opportunities for local growers. This included both existing growers looking for a visible, local venue and new growers desiring to venture into specialty crops production and marketing. As described in the next section, we engaged in two kinds of capacity-building activities – educational workshops for the public and business plan training for 4H and FFA youth – and opened a specialty crops market in 2013.

### **PROJECT APPROACH**

We first provide a summary of our market capacity-building activities, followed by the steps taken to launch and sustain our farmers’ market.

#### Educational workshops

##### *October 2012 - Inaugural workshop*

At this two-hour evening workshop we shared with the community our plans to build a farmers’ market, hosted two speakers, and obtained input on topics of most interest for future seminars. Lewis Jett, WVU Extension Specialist in Commercial Horticulture, spoke on fruits and vegetables with an emphasis on season extension strategies. Russ Richardson, a consulting forester, spoke about special forest products. Thirty people attended the session.

##### *January 2013 - Berry production*

We held a three-hour Saturday workshop featuring experienced growers Bob McConnell (blueberries) and Del Yoder (strawberries) as well as H.R. Scott, Monongalia County Extension Agent (raspberries and blackberries). The speakers provided detailed information about production basics. Thirty-two people attended this workshop.

##### *December 2013 – Cut flower production and marketing*

This was a one-hour evening workshop featuring Barnes Nugent, an experienced grower who has sold in the Morgantown Farmers’ Market. Barnes shared information about variety selection, cultivation, and marketing. Unfortunately, the turnout for this session was low with only six people. We believe that we over-estimated people’s willingness to venture out on a weekday evening in the winter.

##### *December 2013 – Fruit tree establishment and restoration (with emphasis on apples)*

Mira Danilovich, WVU Extension Specialist in Consumer Horticulture, led this two-hour Saturday workshop. She provided a wealth of information about site selection, variety selection, rootstocks, pruning techniques, and pest management. Twelve people attended this workshop.

### *June 2014 – Shiitake mushroom cultivation*

This was a two-hour workshop on a weekday evening led by Dave McGill, WVU Extension Specialist in Forest Resources. Dave provided a cultivation overview followed by a hands-on demonstration of how to inoculate a log. He then supervised participants as they inoculated their own logs to take home. Due to the material expenses associated with this workshop, we required advance reservations. There was enormous response to the workshop, and we had to cap participation at 50 people. While most participants were from Monongalia County, it drew some people from neighboring counties.



### *Youth educational events*

In May 2014, the Arnettsville Public Library (branch of the Morgantown Public Library) and Laura Himes of the Little Indian Creek 4H Club sponsored an Afterschool Adventures Program on planting a “pizza garden.” They discussed root crops and above ground crops, and the 14 participating youth each transplanted a tomato, pepper, and onion. The Library provided a book to each youth.

In late August, the Library sponsored a “kids’ day” in conjunction with a planned visit by the Monongalia County Extension Office to check pressure canner lids. The Library engaged the young people in a garden craft and offered each one a book, and Extension staff had a station to make butter with the kids and parents. While this particular event was not oriented toward specialty crops, it helped to instill in the youth a curiosity about food production and preservation.

### Youth business plan training

Bryan Cheslock, a local grower who participates in the Morgantown Farmers’ Market and holds an MBA degree, worked with Little Indian Creek 4H leader Laura Himes to provide business training to eight young people in early 2013. They gave oral presentations of their plans in April 2013 to a panel that included Bryan as well as H.R. Scott, Monongalia County Extension Agent, Pamela Yost, local grower and NRCS economist, and Al and Jennifer Steele, Arnettsville Community Association representatives.

The youth proposed to raise a variety of products, ranging from strawberries to tree fruits to popcorn and specialized varieties of beans, potatoes, and tomatoes. The quality of their plans varied, particularly in relation to income projections. Two of the youth participated in the farmers’ market when we launched in 2013, and only one continued to participate in 2014. It proved more difficult than expected to engage the youth in improving their business plans and participating in the market, as we explain under “Lessons Learned.”

### Launching and sustaining the market

Before we opened our farmers' market in June 2013, we put effort into developing our market application and guidelines (drawing from the experiences of other markets), organized an informational meeting for potential vendors, and advertised the market. We drew on our community center networks, list of persons who attended educational workshops, newspaper advertising (both paid advertisements and free news briefs), and banners/signage at the community center. We also distributed discount coupons through the local library branch and churches.

The market was held on Mondays from 3-6:00 pm. A total of seven vendors participated. Some (including two 4H/FFA youth) were relatively new to raising specialty crops, and participating in the market helped launch their efforts. Other vendors were more experienced growers for whom the market provided a new marketing outlet that was closer to home. Five of the seven vendors became certified through the Monongalia County Extension Office to accept WIC and senior vouchers.

Overall, we recorded just over \$2,205.50 in total sales the first year, selling common vegetables, fruits, jams and jellies. We considered it "respectable" for the first season and were encouraged by many customers to continue our efforts. Based on a post-season debriefing meeting with vendors, we decided to stay with the same day of the week in 2014 but to push back the market hours to 3:30-6:30 to capture more people going home from work after 6:00. We also attempted to attract new vendors by offering an option for persons who wished to sell for only one to three weeks rather than the entire season.



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materials for constructing a hoop house and a book on season extension techniques authored by Eliot Coleman. We held a setup demonstration in late September and will continue to facilitate

In 2014 we had five returning vendors, one new vendor and three part-time vendors offering a similar product mix to the previous year. While we have not yet received sales data from all vendors, sales reported so far through September 15 total \$1,785. Vendors reported that overall, the season was improved when compared to last year.

By mid-season, it was apparent that while the part-time vendor option helped expand market offerings on particular weeks, its overall impact on the market limited and we needed to pursue a wider of strategies to sustain vendor participation. Our committed vendors expressed a desire to engage in season extension techniques to expand their product mix and the length of the season, we invested in them by providing season extension "kits." Each kit contained

information-sharing as they gain experience with their hoop houses and potentially expand into high tunnels.

### **GOALS AND OUTCOMES ACHIEVED**

*Educational workshops* – We stated in our proposal a goal of offering at least four workshops on various specialty crops topics, targeting an estimated 30 participants each. Through the workshops, we aimed to help new and existing growers make informed decisions about pursuing specialty crops production and marketing, to provide them practical information, and to increase their knowledge of support persons and resources for more information.

With the help of the WVU Extension Service and private growers, we delivered five workshops. Three of them reached the target of 30+ participants, and all of them attracted motivated persons with plenty of questions. We received highly positive feedback about the workshops. While it will take more time to realize tangible benefits in terms of specialty crops production and marketing activities, some participants clearly indicated their intentions to expand production (for example, noting that they were attempting to raise blueberries to sell or were planning to rejuvenate old fruit trees on their property).

*Youth business plan training* – We had proposed to engage 10 youth in business plan training. While we provided training to eight young people who wrote “preliminary” business plans, we were unable to sustain their engagement over the longer term. Nevertheless, two 4H members participated in the market in 2013 and one returned in 2014. This was a valuable experience for them, and the remaining young person could serve as a role model for future 4H youth.

*Farmers’ market* – We set out to develop a specialty crops farmers’ market that would expand local access to healthy food and provide a new outlet for area growers. We launched the market and have had two seasons of experience. The market is small, but we believe that it can become viable over the longer term if we follow multiple strategies:

- Assist current vendors to expand their product mix and lengthen their growing season – We supported this activity as previously described and will continue to facilitate information-sharing.
- Continue to solicit new full and part-time vendors – We provided educational workshops to stimulate interest and have captured contact information. We will continue to follow up with participants to advertise our market.
- Partner with other organizations – For example, another area nonprofit organization is considering the possibility of establishing a community garden at the community center and engaging young volunteers. They could potentially sell produce in the farmers’ market to support the upkeep of the playground or for related purposes.

### **BENEFICIARIES**

*Area growers* – Current vendors clearly benefitted from being able to market their products close to home but in a visible location. Over the course of the two years, nine persons sold in a full-time or part-time capacity, and had total sales of about \$4,700. Other area growers who participated in the workshops but have not (yet) sold in the market also benefitted from the project. It is difficult to quantify how many of these attendees will grow specialty crops for sale, but we are aware of several who have started growing new crops or who intend to do so.

*Area residents* – The market provided a local source of healthy food options. We logged over 1,000 customer visits over the two years, but that included visits by repeat customers. Though

there was limited participation in voucher programs, we hope to expand that in the future to increase accessibility to lower-income residents.

*Arnettsville Community Association and its partners* - This project expanded the activities of and support base for the Arnettsville Community Association. The educational workshops and farmers' market attracted people to the community center who had never been there before, and we expect some of these people to support future activities. Further, the presence of the market bolsters our case to funding agencies when we seek funds for operating support. The market therefore not only had a direct effect on vendors and customers, but also an indirect effect on the organization and its ability to continue providing a range of community services.

The impacts of this project as described above will be multiplied over time as the market grows. It would have been impossible to take the initial capacity-building steps and launch the market without the support of the specialty crops grant.

### **LESSONS LEARNED**

A highly positive lesson learned is that a great deal can be accomplished through partnerships and cooperation. This project would not have been possible without the support of the Arnettsville Community Association, the WVU Extension Service, Arnettsville Public Library, and a core group of committed vendors who were willing to take a risk on a new venue without an established customer base.

Lessons learned from challenges:

- We made too many assumptions about our ability to broadly engage young people in developing business plans and launching into specialty crops production. We might have been more successful if we had initially focused our efforts on the few who were most interested and then involved them in recruiting other young people.
- Building a market requires sustained attention to both customers and vendors – In our first market season, we did not systematically capture customers' contact information. We did so in our second year, knowing that this information will be critically important for direct advertising. On the vendor side, we will continue our efforts to nurture our most committed vendors while welcoming new ones. We will also explore different means to more directly involve vendors in market governance.

**CONTACT PERSON**

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**Applicant: West Virginia Department of Agriculture-Marketing & Development Division**  
**Project: “Statewide Marketing Activities to Enhance Specialty Crop Production Through Marketing & Distribution”**  
**Amount Requested: \$63,110.78**

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### **Project Summary**

This project was designed to address the unique geographic and economic scale of West Virginia farmers through a targeted marketing program on a local and national scale. West Virginia is constantly cited by the USDA agricultural statistics as the state with the highest per capita of family farms while leading the nation in lowest revenue totals per farming operation. These factors indicated a need for increased access and marketing of state products as well as a determination of economic impact of increased promotion of WV specialty crop products. Previous SCBGP projects targeted on marketing focused on consumer awareness with limited attempts/success at ascertaining economic impact in terms of returns to specialty crop producers and manufacturers.

### **Project Approach**

The approach to this project included multiple marketing activities aimed at consumer preference and purchasing decision acquisition combined with education on the variety of available West Virginia specialty crops. Within this project, a diverse media mix (print, broadcast, trade shows) were utilized to accomplish the results. An attempt to measure economic impact through increased sales as well as new products introduced to the marketplace. Specifically, the project activities included participation at the 2011 Charlotte Christmas Show by value added and fresh (apples & winter crop) producers and manufacturers, development of an agritourism publication focused on attractions featuring specialty crops (i.e. farmers markets, pick your own, wineries, etc.), participation by value added specialty crop manufacturers at the 2012 Washington, DC Fancy Food Show and the publication of WV tourism region specific tourism itineraries providing travelers an opportunity to experience (and purchase) WV specialty crops (i.e. farmers markets, pick your own, wineries and Christmas tree operations).

Economic benefits were determined by direct sales at some events (Charlotte Christmas Show) and by survey of increased sales attributed to the SCBGP activities self-reported by producers and manufacturers. Direct sales exceeded the direct revenue expectations but the reliability of the data in terms of underreporting will be explored in the “Lessons Learned” section. Participation by companies also exceeded outcome expectations with the introduction of both new products and producers/manufacturers meaning the activities captured future specialty crop expansion and sales. Solicitation of data on market results directly attributable to SCBGP proved difficult to obtain but the minimal results were enough to exceed goals. Results from one project activity (itinerary sheets highlighting specialty crops within tourism regions) was completed near the end of the grant cycle so results are not available or complete.

Project partners included the WV specialty crop and producers that participated in the grant activities (at least 90), the WV Farmers Market Association and their member markets who assisted in collecting market information concerning consumer preferences, the three media events with hits (more than 750,000 households reached) benefitting farmers/processors with increased knowledge and product exposure (eblast, media advisory and satellite uplinks for 2011 fall/holiday, 2012 farmers market and 2014 Small Farm Conference educating about the upcoming growing season; >\$120,000 of documented earned media) and the local and regional targeted marketplaces who benefitted from the introduction of new products (at least 10) and new producers/processors (3 documented to date).

### **Goals and Outcomes Achieved**

The project had three goals related to the outreach activities conducted. These included sales, participation (including generation of new companies and specialty crop products introduced) and an evaluation of consumer preferences in terms of market accessibility of West Virginia specialty crops.

Sales of fresh and value added specialty crops was measured through direct revenue as recorded by sales at the Southern Christmas Show and post show evaluation concerning additional sales and new accounts by participating specialty crop companies. Forty eligible companies (210 SKU products) were evaluated for sales and post show survey. Initial sales indicated \$79,000.00 of direct economic impact with a disappointing reporting of \$3,135.00 of post show data. The ability of companies to track the post show sales proved to be difficult as they did not or were unable to track sales figures during the busy holiday season. The impact, qualitatively, was indicated by disappointment in 2013 and 2014 when the activity was not conducted but the value of their participation through product provision was not obtainable. The post show reporting came from companies that sampled and participated in the event; smaller and newer companies who utilized the event as a sales learning experience. Despite a verbal indication that the direct sales numbers were greater than reported, lack of documentation mean that this goal was short in attainment. The Fancy Food Show event only generated \$4,835 of sales generated at and after the show. In addition to difficulty in securing participants that were specialty crop eligible, companies were reluctant to share onsite and after show sales figures. These issues are addressed in the “Lessons Learned” session for future participation in events/activities within the program that require economic data reporting.

Increased participation by market entry of new companies and new products were the target of the second project outcome. Fifty-eight specialty crop eligible companies participated in one or more activities of this project and four new companies (3 fresh crops, one value added) as well as 25 new products were documented as a part of the activities in this project. One additional company changed ownership and they are in the process of adding four new tomato based value added products.

The final outcome was based on media outreach and an evaluation of consumer preferences. During the 2014 Small Farm media event, farmer, processors and consumers were asked about their preferences in terms of markets preferred to obtain West Virginia specialty crops as well as product and varietal demands. The event is unique in that more than 300 WV farmers and processors attend the 4 day program for education and information and the general public participates in the state's largest winter farmers market. Forty participants (20 farmers/processors & 20 consumers) provided information for this outreach.

The results were not surprising as they tended to follow state and national trends. Farmers expressed an interest in high tunnel production, increased production efficiencies, increased market reach and access to marketing and educational programs. Off and season extension activities to expand growing and marketing season were of particular interest. The winery industry expressed issues concerning market opportunities due to restrictions as a barrier preventing them from expanding. On the consumer side, longer farmer market seasons, more and consistent winter markets as well as more winter crop diversity (winter crops beyond squash and apples) were frequent themes. Interest in having product available for local schools demonstrated the effectiveness of the targeted impact of the state's farm to school initiative and provided impetus to continue both the education and production targeted for this market. Farmers markets continued to be the most common market for WV specialty crops as supply concerns were at the top of both production and consumption concerns....the specialty crop industry in the state needs an increase in production to meet consumer demand.

### **Beneficiaries**

This project provided specialty crop producers (both fresh and value added) the opportunity to recognize economic return as a result of the project activities. New companies and products were identified in this project meaning targeted technical assistance by agriculture service providers can be provided as a result of participation in this project. Results from the preferences survey provide producers and processors valuable information on demand status while consumers were able to express their need for consistent markets as well as identifying future markets of interest (Farm to School). The earned media numbers reflect benefit from the public in terms of increased awareness and specialty crop availability with more than 750,000 with at least one exposure to the broadcast media messages.

### **Lessons Learned**

Demand for food safety and technical training in the areas of specialty crop production and processing are ongoing. Becoming FSMA compliant has been difficult to "sell" to farmers as those at the micro and small level feel that exemptions or phasing in will eliminate the need for addressing this need through training and proactive, risk-based activities. Although there were not whole sale "buy-in's" in terms of large numbers for the training, industry front runners

recognized the need and the activities of this project have led to an increased interest in future training and the need for establishing best practices for on-farm, post-harvest and processing of specialty crops.

Participants could qualitatively describe that they had inquiries and positive response from their participation in several of the outreach events but were often unable to correlate with a specific dollar inquiry. To resolve the issue of obtaining sales data for SCBGP funded activities, any further projects will require economic reporting as well as grant reporting so that participants understand the funding source as well as their responsibilities in carrying out the activities of the grant.

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**Applicant: West Virginia Department of Agriculture-Marketing & Development Division**  
**Project: “Statewide Activities to Enhance Specialty Crop Production Through Producer Education and Training”**  
**Amount Requested: \$19,636.37**

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### **Project Summary**

Expanded production and consumption of specialty crops are critical for West Virginia to become more efficient at providing growth and revenue in the agriculture sector. An increased emphasis on domestic production has been identified as the critical factor in eliminating the “domestic” trade deficit when faced with more than \$7 billion worth of food consumption in the state and less than \$1 billion in agricultural crop production (mostly identified in the non-specialty crop sectors). The deficit represents a significant opportunity in the WV farm communities. Education in terms of production efficiencies, trend utilization and marketplace compliance are essential and the focus of this project.

### **Project Approach**

A variety of educational programs and methodologies were employed to conduct this project. Training in the form of an FDA mandated Better Process Control School (BPCS) for value-added specialty crop producers resulted in new company and product introduction to the marketplace. Three GHP/GAP classes (West Virginia State University, Glenville State College Ag Innovations Conference) were offered with a total attendance of 52 producers. It is anticipated that future production under these guidelines (and/or successful audit completion) will mean more efficient utilization of reimbursement funds. Utilizing the national GHP/GAP Cornell University workbook, food safety directly related to specialty crop production and the familyfarmed.org plan template was presented to 150 Annie’s Project participants during the grant project.

Attendance at the 2012 North American Farmers Direct Marketing Association (NAFDMA) Conference and subsequent specialty crop agritourism track at the WV Small Farm Conference provided a scholarship opportunity for Brookedale Farm (bedding plants, corn maze, pumpkin patch and school tours) to provide three follow up peer presentations on the industry opportunity as well as a trend presentation by the attending agriculture service provider. In November of 2014, Brookedale Farm owner, Donna Brooke Alt, was the keynote presenter about her agritourism operation at the first WV Women in Agriculture Conference with over 150 farm operators in attendance. Additional scholarship opportunities became limited due to state purchasing guidelines and the remaining funds were redistributed but the impact of the peer directed learning has prompted multiple requests for information on agritourism development as well as the in progress statewide Agritourism Initiative course conducted based on the needs assessment and work generated from this project.

In addition to Brookedale's presentation at the Small Farm Conference after the NAFDMA learning experience, a track within the program on agritourism development specific to specialty crop emphasis was conducted. The full day program featured two presentations by NAFDMA national board member Hugh McPherson focusing on staffing and trends in specialty crop utilization on the farm through agritourism (i.e. school tours, recruiting and training staff, off season ideas for orchards and pick your own operations, etc.). A presentation from the state coordinator of the WV Junior Master Gardener program as well as interactive activities from the curriculum provided the participants (28 participants) solid curriculum based activities as well as a way to correlate the specialty crop specific activities to statewide science, technology, engineering and math (STEM) concepts. Future Small Farm Conferences have continued to expand on this full day workshop to provide relevant trends, activities and innovations in specialty crop based agritourism.

### **Goals and Outcomes Achieved**

The GHP/GAP reimbursement process was established as a program providing audit assistance to specialty crop producers seeking certification. Utilization of the funding, however, was disappointing with only two operations taking advantage of the funding. A discussion on increased participation remediation is addressed in the "Lessons Learned" section. The two companies that did take advantage of the program allowed for market entry into two major retailers (Whole Foods in the DC region for hydroponic leafy greens and Kroger in the southern section) based on supplier requirements.

The BPCS participant survey was able to confirm the addition of more than 23 new specialty crop products amongst six new products. One company, Leavitt Farm has since introduced more specialty crop value added products as the BPCS participant continues to hone in on consumer preferences and replace inventory from several companies that have retired in the past 3 years.

More than 230 participants in the training programs provided in this project (BPCS, GHP/GAP, NAFDMA Conference and Annie's Project-70) provided five new companies that entered specialty crop enterprises. These included one agritourism start up, three value added specialty crop food manufacturers and one high tunnel operation. In addition to the start-ups, several enterprises expanded their specialty crop operations based on training and technical assistance provided under this project. For example, an Annie's Project participant was able to provide value added herb products at the local farmers market by completing a full farm food safety plan that included market operations (temperature monitoring & documentation) leading to fulfillment of local sanitarian requirements based on the materials and education provided under the activities of this SCBGP project.

The project did not attain its outcome of providing GHP/GAP successful audit reimbursement. With only four audits conducted throughout the state, there was insufficient demand for the

funds in addition to difficulties getting the other 2 farms to submission the necessary, state-mandated documentation for reimbursement. As a program priority at the national and state level, participation by farmers in the audit process is difficult without size and scale to make markets that mandate the certification practical or economical. Additional strategy to expand both audit requests and fund utilization will be undertaken in 2015 as the state's growing Farm to School initiative begins to require the basic GHP/GAP course offered in this project and Food Service Directors begin to increase documentation and food safety plan emphasis.

The increase in interest surround specialty crop centered agritourism meant the addition of at least one enterprise and the development of a state-wide, risk management centered training program through another grant award. Sickler Farm was a participant in the Annie's Project and GHP/GAP training programs. The high tunnel, season extension operation had not hosted tours in the past. The addition of potted spring flowers and educational tours have driven demand for their products from the local community and established visitation to the farm. Additional farm operations are planning on adding pumpkin patches and corn mazes, development of school visit curriculums for youth visitors and cooperative itinerary planning with tourism enterprises in the region from the work accomplished in the SCBGP marketing project within this State Plan.

The NAFDMA Conference activities were limited to the initial Conference participation by scholarship recipient Brookedale Farm and the residual sharing accomplished by the educational program participants. The sharing of specialty crop production and availability proved to be valuable as a peer learning experience. The remaining project funds were reallocated elsewhere due to restrictions within the state purchasing system requiring vendor registration fees for reimbursement to individuals.

Program income recognized by the program was \$1,575 in registration fees that were used as a reinvestment in the project to cover ineligible grant expenditures (meals, etc.).

<b>Measureable Outcome</b>	<b>Target</b>	<b>Achieved</b>	<b>Net</b>
<b>New value added specialty crop products</b>	5	49	Frooper's (25); Yoder's (20); Chico's (2); Minard's (2)
<b>Participation by individuals in a training segment</b>	75	86	(18-GHP/GAP 2-26-14; 38-Glenville 1-24-14; 3-2012 NAFDMA; 26-Specialty Crops in Agritourism (Sm Farm Conf; 27 participants-19 SCBGP product qualified
<b>Statewide GHP/GAP cost share</b>	5	2	-3
<b>Addition of specialty crop centered agritourism enterprise</b>	1	2	Sickler Farm, Brookedale Farm (specialty crop based; pumpkin school tours)

### **Beneficiaries**

Participants in each of the learning opportunities benefitted from this project in terms of certification, access to additional markets (retail markets), technical assistance provisions, and partnerships leading to increased specialty crops in the marketplace (consumers as beneficiaries), improved food safety and documentation skills (public health) and specialty crop enterprise operators/manufacturers (increased economic benefits providing expansion and additional market entry).

One hundred thirty-eight documented companies were able to benefit from the training provided by this project primarily through compliance and expanded economic opportunity brought about by increased market share. Secondary impacts are too numerous to quantify when you consider that much of the training is centered around food safety and security. This means customers and visitors of products and services consumed can be counted as beneficiaries of the training provided by this product.

### **Lessons Learned**

This project was essential in the development of the specialty crop industry in the state but difficult in terms of administration. A switch and modifications to state purchasing rules made

reimbursements difficult especially to individuals and required both procedural changes and reallocations in order to fulfill the grant requirements and targeted outcomes. Future projects have been structured to alleviate the obstacles as well as additional information to subrecipients regarding procurement and purchasing requirements were initiated in subsequent grant cycles and should provide more obtainable project scopes that do not require major reallocations. These issues within projects that are granted to subrecipients have also been alleviated through increased project monitoring efforts.

Utilization of GHP/GAP reimbursement funds is the second area that has proven problematic in this project. Development of subsequent trainings (more GHP/GAP courses and the development of a Writing YOUR Food Safety Plan) as well as continued emphasis in the Annie's Project training are targeted programs that attempt to provide additional incentive to complete the audit process. Technical assistance in terms of providing guidance on reimbursement for all successful audits are also a target.

On a positive note, the outreach and peer mentoring conducted by the NADFDMA scholarship (Brookedale Farm) has provided a model specialty crop based agritourism enterprise.

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### **Additional Information**



**Applicant: West Virginia Department of Agriculture**  
**Project Title: “Veteran and Warrior to Agriculture Program-Production Farm Expansion”**  
**Amount Requested: \$27,196.87**

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### **PROJECT SUMMARY**

The purpose of the program was to create and maintain a program that encouraged, supported, and developed WV Veterans in the field of agriculture, while increasing the production of specialty crop production within the state.

With increased numbers of Veterans returning from combat theaters and WV operating in a food production deficit, the timing is perfect to train more farmers in WV and Veterans are uniquely qualified and are a good “fit” for this role.

This project was started with bee keeping training, which was funded through private grants and support. Expanding the program to include a production training farm is a new venture with no previous funding.

### **PROJECT APPROACH**

We set out to demonstrate that chemical free sustainable farming would be productive on 4 acres of land. The success of those who farmed on their land was much greater than that of the educational farm, in part due to equipment and labor. We intended to have 10 participants to help maintain the 1 1/4 acre plot on a state farm; however, there was no perceived benefit to anyone to come “work and learn” for free. Location and distance from population centers combined with lack of transportation was one issue. Lack of pay was another. Therefore, we made the decision to allow 10 participants to grow specialty crops on their own land, and that resulted in great success. We provide seeds and transplants and they provided labor.

The educational farm was hand planted by two contract workers, one part time. There was no irrigation in the field and therefore we used approximately 700 feet of hose to water the field. There was a large disconnect between the need for purchasing equipment and ORMI herbicides since the places we needed to purchase from were not State approved vendors. Additionally a transition in purchasing systems created a 30 day window where no local purchases could be made.

Defined planning and prior approval of purchases before the beginning of a project is the biggest take away from this experience. Our sustainable and holistic approach, turned out to be neither. Although we managed to achieve some of our goals by shifting and adapting, the lessons learned greatly outnumbered the overall success.

### **GOALS AND OUTCOMES ACHIEVED**

1. Create and maintain a program to encourage, support, and develop WV Veterans into the field of agriculture.

In support of this goal we obtained a 4 acre tract of land and leased out 3 acres with rent proceeds directed back into the program. WVDA had the land disced and tilled for us, and we hand planted a 1 1/4 acre with 100 foot rows of sweet potatoes, cabbage, squash, cucumbers, a variety of peppers, onions, and white potatoes. We also planted 100 feet of blackberry plants and 50 feet of blueberry plants. We used sustainable, non-chemical methods in the development of this production field.

We were unable to recruit any Veterans willing to work on the Lakin Farm property. Many were interested in a paid position or paid internship, but we were not funded for that and consequently the entire site has been managed and maintained by two people. This is not sustainable. We were also unable to make acceptable arrangements with the Dept. Of Corrections for the use of the 2 women Veterans at Lakin Correctional Facility.

As a solution to this problem, we enrolled 12 Veterans into the program and had them plant backyard gardens with plants/seeds provided by this grant. The total area planted by these Veterans is approximately 3 acres. Everything planted meets the guidelines of specialty crops.

2. Increase the number of Veterans involved in agriculture and widening the scope of Veterans activities and opportunities in agriculture.

Through training and mentoring, we have a total of 12 enrolled Veterans growing specialty crops in WV (Baily, Earl, Given, Grandon, McCormick, Norvell, Payne, Ramey, Stump, Tartt, Towner, Wisely). All these production sites are in backyards or on family land. We have also assisted 4 Veterans who had already begun their own agriculture businesses with funding seeds, resource referral, and mentorship. (Earl, Grandon, McCormick, Stump)

In order to reach the largest amount of participants, we sent out training newsletters to aid those unable to travel to training centers. We also supplied the following training aids for our Veterans who were interested in sustainable agriculture practices:

Sustainable Vegetable Production From Start-Up to Market (1999) Grubinger, PALS publishing

We offered several training events that helped establish or improve Veterans agriculture businesses. GAPS and Business Planning were two specific goals in our grant:

June 21, 2014 Introduction to GAPS: Why is it important?

Sept 12, 2014 GAPS Certification Course (w/ Va Tech Professor; Cornell Certified GAPS Trainer)

Sept 13, 2014 Mushroom Cultivation Workshop (w/ WV State University Extension)

Sept 20, 2014 Business Basics, Three Page Business Plan workshop (w/ WVU Extension)

and a follow-on class is being held after the end of this reporting period in order to ensure a solid business plan is produced by each participant.

In the end, we did increase the number of Veterans operating agriculture business by 4, and are working with 3 more to develop plans involving apiaries, vegetable production, and agri-tourism businesses.

### 3. Increase the production of specialty crops within WV.

We have successfully reached this goal by placing 4 acres into production, even though they are not all located at the originally planned site. By establishing a relationship with WVU and WVSU extension offices, we have begun a program that will have lasting affects on the number of Veteran Farmers in WV. We surpassed our goal of enrolling 10 Veteran Farmers to produce on 4 acres. Our total production from all sites was approximately 3700 pounds of specialty crops.

We also have included specialty crop production in the training of bee keepers in WV by creating pollinator gardens that include brambles, flowers, and Specialty Crop vegetables that not only feed the bees, but also produce specialty crops for consumption or sale.

Additionally we have a berry patch that contains 75 blueberry and blackberry bushes that will begin to produce enough to harvest in the 2015 season. These bushes will produce increasing amounts over the next 5 to 7 years.

#### **BENEFICIARIES**

Veterans benefitted from this program by growing approximately \$500 worth of food each for their family to consume and preserve, but several were able to provide for extended family or sell excess for a profit.

Not only did the 12 Veterans that participated in this program benefit, but the community as a whole benefited from our support of the Facing Hunger Food Back, several area homeless shelters, and sale of healthy produce at the Wild Ramp. We donated 187 pounds of cabbage (valued at \$56.10) and sold 80 pounds of cucumbers (\$111.83) to the Facing Hunger food Bank for use in their food distribution program. We also sold \$260.02 in fresh produce through direct sales at the Wild Ramp local foods store in Huntington, WV. This market reaches a wide demographic in the West End of Huntington WV including many Senior Citizens and SNAP beneficiaries.

#### **LESSONS LEARNED**

An educational farm that is dependent on volunteer labor in exchange for learning/training must be located in a central, reachable, convenient location. Our location was on average one hour away from most participants, and the educational experience was not significant enough to motivate them to drive that far. This resulted in two program personnel planting, maintaining, and harvesting one and a quarter acres by hand with no mechanization after the initial tillage. The lesson learned is site selection is critically important, as is firm commitment by participants prior to starting a project like this. However, we also learned about better ways to plant and

maintain a production field such as row spacing, use of limited mechanized processes, and selection of and education about ORMI herbicides and pesticides.

The use of organic methods without technical support was not successful. We learned that



without herbicides and pesticides, more labor was needed to care for the crops. If we had trellised the sweet potatoes, we might have had a better result because we could have mowed the weeds that competed for nutrients. Final lesson is that chemical free production on this amount of land, done by hand, is not sustainable with only two part time farmers. We needed greater support in the form of manpower and equipment. Even if the labor from the prison would have been available to use, without equipment results would still have been dismal.

Since the participation on the educational farm site was zero, we looked for other ideas that would reach Veterans and increase production of specialty crops. We determined that offering seeds, plants, and technical advice on site at a Veterans backyard garden or farm plot was much more successful. With the initial planning and assistance with seed/plants, our 12 Veterans were able to produce approximately 3900 pounds of produce. This number will be slightly higher since not all produce has been harvested. This number could also have been much higher if planting had begun on time, however; we were delayed due to startup of program establishment.

#### **CONTACT PERSON**

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#### **ADDITIONAL INFORMATION**

We established a Facebook Page which contains photos of our produce and announcements of our events. Below are three photos of part of the harvest at the educational farm.