FY2010
Specialty Crop Block Grant Program
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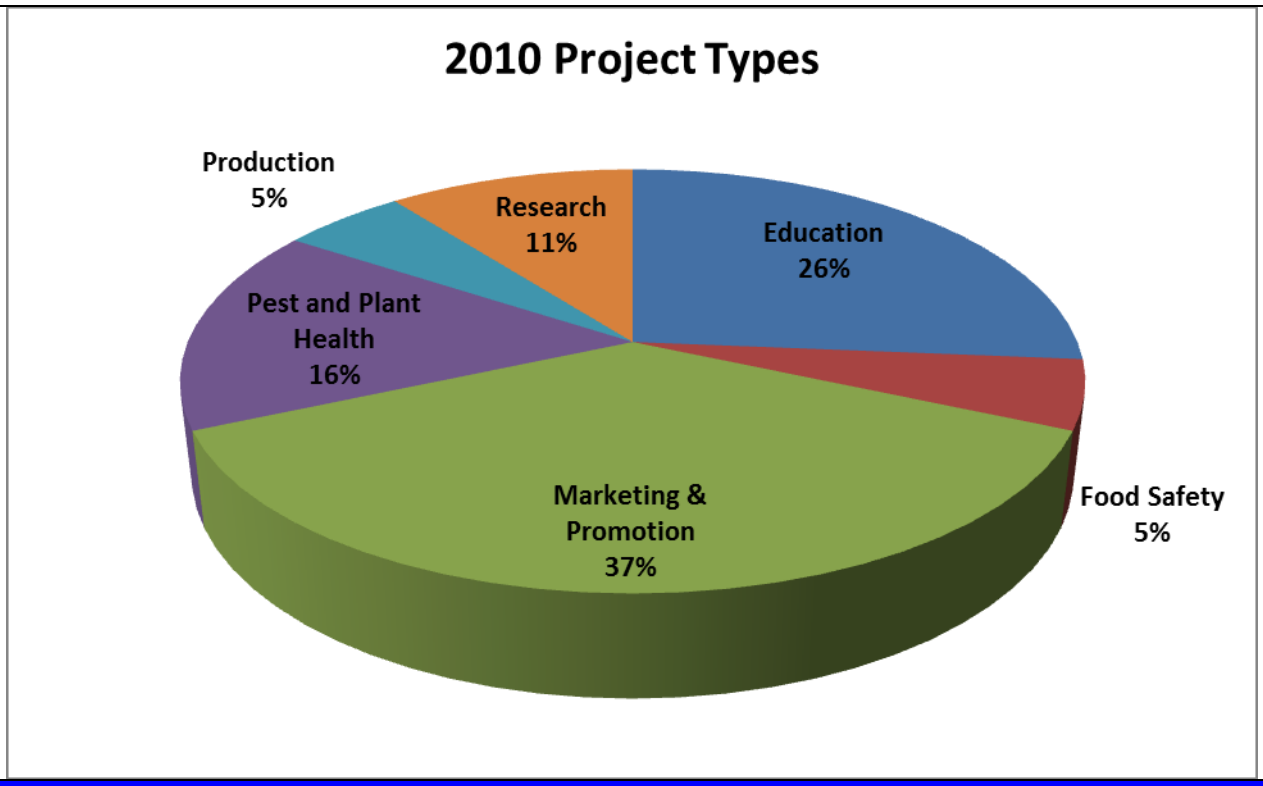
CONTENTS

Background: 1
FY2010 Pennsylvania Department of Agriculture Specialty Crop Block Grant Summary 1
Project Title: 2
Strengthening and Expanding the Mushroom Industry Food Safety Initiative, Project 1 2
Project Title: 6
Philly Farm to School: Transforming School Meals, Project 5 6
Project Title: 13
Fayette Farm Market Development and Promotion Project, Project 6 13
Project Title: 16
Production, manipulation & marketing of Seascape Strawberries conducted by Linvilla Orchards, Project 7 16
Project Title: 20
Farm Market Campaign for Pennsylvania Apples, Project 8 20
Project Title: 26
Expanding Cooperative Extension Farm Food Safety Training, Project 9 26
Project Title: 34
PA Produce Consumer Awareness Promotion, Project 10 34
Project Title: 49
Implementing Integrated Pest Management Control Strategies for Invasive Armored Scale Pests of the Christmas Trees, Project 11 49
Project Title: 61
Direct Farm Sales Program, Project 12 61
Project Title: 65

Bureau of Market Development, PA Preferred, Project 13 65
Project Title: 68
Good Agricultural Practices Bilingual Training and Education Program for PA's Produce Industry, Project 14, Activity 4 68
Project Title: 68
Using Biological Inoculants to Enhance Establishment, Stand and Yield in Raspberries and Strawberries, Project 15 68
Project Title: 74
Combating Invasive Pathogens that Threaten Specialty Crop Markets, Project 18 74
Project Title: 78
Controlling Tomato Diseases; Organic and Sustainably Produced Tomatoes, Project 20 78
Project Title: 80
Microbial Survey of Pennsylvania Surface Water used for Specialty Crop Irrigation and Development of Sampling and Handling Procedures for Surface Water Testing, Project 22 80
Project Title: 89
Increasing the Quality of Pennsylvania Wines Through the Expansion of the Pennsylvania Wine Quality Initiative (PAWQI), Project 23 89
Project Title: 93
Increasing Consumption of PA Specialty Crop Fruits and Vegetables among Urban Youth in the City of Philadelphia Recreation Center Program, Project 24 93
Project Title: 99
A Case Study of Pennsylvania's Simply Sweet Onion: A possible Model for Market Development of Specialty Crops, Project 27 99
Project Title: 101
Mushroom Industry Specialty Crop Project 101
Project Title: 102
Good Agricultural Practices Training and Support for the Pennsylvania Fresh Produce Growers 102

Background:	**FY2010 Pennsylvania Department of Agriculture Specialty Crop Block Grant Summary**
	In 2010, the Pennsylvania Department of Agriculture (PDA) was awarded $1,069,427.21 to promote the Specialty Crop industry throughout the state. Affirmative steps were taken to conduct state outreach to socially disadvantaged farmers and beginning farmers of specialty crops by PDA. Potential applicants were targeted through the Penn State University county extension offices, state and local associations, and the various USDA offices, to include FSA, NASS, RMA, USDA-RD and PDA economic development programs. The methods used to reach the targeted agricultural community included: press releases (300 PDA outlets, PR newswire service via the Governor's office) being sent to all above outlets, as well as, eight trade journals targeting producers throughout Pennsylvania, the state Agricultural Newsletter and other community newspapers. Presentation of grant round was included in the PA Fruit & Vegetable newsletter, mailings, and quarterly meeting. PDA received a total of twenty-four (24) specialty crop block grant applications. The grant applications were reviewed and prepared for presentation to the appointed specialty crop advisory board. The board members were invited based on their professional resumes, and ability to provide impartiality. A total of twenty (20) projects were awarded funding. An annual or final report for each project is listed below.



Project Title:	**Strengthening and Expanding the Mushroom Industry Food Safety Initiative, Project 1**
Project Summary:	The principal purpose of this project is to insure a safe food supply and maintain the economic viability of the Pennsylvania mushroom farm community. The mushroom industry has a significant economic impact on Pennsylvania, employing thousands of workers, with millions of dollars paid in wages, taxes and services. Since food safety is their number one priority, this project was designed to continue and build upon the momentum of food safety activities initiated over the past several years by mushroom growers, packers and shippers. Education and training needs, as well as research gaps, were identified. Strategies to address these opportunities with new research, additional opportunities for grower education and new training tools were developed and delivered to all segments of the mushroom farm community – owners, supervisors and harvesters. Previous projects funded through the Specialty Crop Block Grant (SCBG) program helped to establish the foundation of the mushroom industry food safety initiative –the Mushroom Good Agricultural Practices (MGAP) program – along with educational seminars and training materials to help growers with implementation. This project is timely given the importance placed on food safety by retail and foodservice customers as well as consumers.
Project Approach:	Update MGAP Standards and Audit At the recommendation of the AMI Food Safety Task Force, no changes were made to the Standards and Guidelines of the Mushroom Good Agricultural Practices (MGAP) program in 2011. However, the Task Force continues to add information and update the How to Comply/Frequently Asked Questions manual to accompany the MGAP program documents to clarify grower, supplier and auditor issues.

At a Penn State Food Safety workshop on March 8, 2011, Pennsylvania growers discussed the MGAP program, ongoing food safety issues and training needs with members of the Food Safety Task Force, Penn State personnel and food safety consultants. The group provided guidance on future efforts.

Throughout the summer of 2011, AMI consultants visited approximately 15 farms and attended group meetings to gauge the acceptance of the food safety program and ask what additional assistance could be provided. The overwhelming response was positive and feedback resulted in the Initial Hire DVD as described below.

The Food Safety Task Force met in September 2011 to review the MGAP Standard and Guidelines. Approximately 24 participants also discussed current research, research needs, the Specialty Mushroom Good Agricultural Practices program, concerns with auditing practices and the Produce Traceability Initiative (PTI).

Financial assistance was provided to Dr. Luke LaBorde at Penn State to supplement on-going research concerning verification of the composting process and microbial populations in casing materials. This research provides scientific verification and validation studies for specific MGAP standards.

Update and expand MGAP educational tools
The Mushroom Industry Food Safety Training Flip Chart (also known as the Breezeway Food Safety Training Flip Chart) was developed and introduced in March 2011. The Flip Chart contains five comprehensive lessons (delivered separately or collectively) designed to provide workers with the knowledge and skills they need to follow food safety rules at work. The lessons are:

- Foodborne outbreaks and the potential for mushroom contamination
- Personal hygiene
- Hand washing and glove usage
- Cross-contamination in the farm
- Food defense

The Flip Chart was developed with extensive input from food safety consultants, Penn State Food Science Department faculty and mushroom farm personnel. It was distributed to the industry through a series of train-the-trainer sessions held in Spanish and English between March and May 2011. More than 50 individuals attended the sessions.

Supervisory level food safety training seminars were held in June, September and November 2011. During the seminars, supervisors received training in management techniques to instill a culture of food safety compliance. The seminars used an interactive approach with discussions in Spanish.

Upon the recommendation of growers, the information presented in the initial hire training poster (developed through a previous SCBG) was converted into an “initial hire” DVD. The DVD runs 15 minutes in length, can be viewed in English or Spanish and provides workers with the basic food safety information they need before starting work on a farm. Development of the DVD script began in August 2011 and the final DVD was shipped to growers in May 2012. More than 150 DVDs have been distributed.

Additional food safety posters were developed in response to grower requests. A revamped database was also launched that allows targeted food safety information to be available to mushroom growers, packers, shippers and industry suppliers. In March 2011, AMI assisted with the distribution of a training DVD for the EPA Worker Protection Standard, which is also a component of the MGAP program. At the Penn State Mushroom Industry Conference in June 2011, a booth manned by AMI staff provided copies of food safety training materials to attendees.

Food Safety Website
As part of a general AMI website redesign project, the existing Food Safety and MGAP websites have been reorganized and made more user-friendly.

Develop more extensive Spanish language food safety materials
All new food safety materials continue to be printed in both English and Spanish. Sessions were held in Spanish to introduce the Food Safety Training Flip Chart and the Initial Hire DVD. The three supervisory level seminars held in June, September and November 2011, with a total attendance of 90 participants, targeted Spanish-speaking supervisors to reinforce food safety training messages.

Partner with Penn State Extension Service
With assistance from this grant, Drs. John Pecchia and Luke LaBorde from Penn State conducted two projects – a Phase II compost process verification study and a study of microbial populations in casing materials. Preliminary results were discussed at an AMI Research Committee meeting on June 19, 2011 with 20 participants and presented to approximately 120 participants at the annual Penn State Mushroom Industry Conference on June 20, 2011 in Mendenhall, PA, and at the September 2011 Task Force meeting. Also at the Penn State Conference, Dr. Sergio Nieto-Montenegro conducted a supervisor/management training seminar in Spanish, and AMI hosted an exhibit booth where MGAP materials were displayed.

Dr. LaBorde, Dr. Nieto-Montenegro and AMI staff were participants in the USDA/FDA Food Safety Alliance conference in Orlando in June 2011. The mushroom industry food safety initiative was one of only two commodity programs highlighted and Dr. Nieto-Montenegro was invited by the Alliance to make a presentation.

Additional partnerships with Penn State include the food safety seminars held March 8-10, 2011 discussed below.

Continue development of the Specialty Mushroom Good Agricultural Practices (S-MGAP) program
At the suggestion of Dr. LaBorde, a modification to the existing MGAP standard was proposed and presented at the September 2011 Task Force meeting. The modification would allow the MGAP standard and audit to be applicable to farms growing any variety of mushrooms. The modification has been proposed to third party auditors and a pilot audit requested. Meetings have been held with USDA officials to discuss the audit.

In March 2011, a pilot audit of the Harmonized Good Agricultural Practices program was conducted at a mushroom farm in Chester County. The Harmonized GAP audit could potentially be a model for a single audit for all varieties of mushroom production.

Provide guidance and training on implementation of traceability practices
At the Penn State Food Safety Seminar in March 2011 participants discussed the Produce Traceability Initiative (PTI). Few mushroom packer/shippers have begun to implement the program because of costs, complexity and confusion over what their customers will require. AMI staff conducted an informal survey of mushroom packer/shipper operations to determine what their plans were, the level of interest and what AMI could do to assist. It was determined that AMI should primarily provide information. As a result, AMI has publicized PTI implementation webinars and is a member of the PTI Association Interest Group. AMI staff and a member of the Food Safety Task Force attended a meeting in October 2011 to voice the concerns of the mushroom packer/shippers to the PTI Leadership Council. Additional information will be provided in upcoming issues of the Mushroom News.

	Coordinate research and development of sanitation protocols and procedures for packinghouses, followed by employee education and training On March 8, 2011, a one day seminar with 25 attendees focused on the food safety risks associated with the production of whole and sliced mushrooms and control measures that prevent these risks. It provided basic information on the pathogenic microorganisms associated with mushrooms, personnel and facility control measures, sanitation and testing. This seminar, developed and presented by Penn State faculty, was designed to benefit employees from all levels of a company. This was followed by a two-day basic course in HACCP (Hazard Analysis Critical Control Point) taught by certified instructors with extensive experience in food safety training.
Goals and Outcomes Achieved:	The goal of this project was to improve and expand the food safety culture on farms, through increased training materials that responded to identified needs. The educational seminars and training tools make it easier for those responsible for training, supervising, implementing and enforcing food safety messages and requirements. An additional goal was to take the basic food safety training messages and present them in new formats – this was accomplished through the Flip Chart and DVD. To insure they were applicable for all employees, the materials are available in English and Spanish. New information was presented in seminars, on the website, in posters and in Mushroom News articles. Research conducted by Penn State on the composting process and microbial populations in casing materials will provide verification and validation studies for specific MGAP standards. This adds credibility and bolsters the scientific knowledge base that the MGAP program is built upon. It is a clear example of an activity that could not have been performed by individual growers.
Beneficiaries:	There are 71 mushroom farm operations in Pennsylvania, which last year produced 550 million pounds of mushrooms – leading the nation in production – with a farm gate value of $500 million. A food safety outbreak could devastate the economic viability of the industry and result in a reduction of its workforce. This project directly affects each of these farms. More than 85 Flip Charts and 150 DVDs were directly distributed to farms. The numbers of participants in the various educational and training seminars are included with the summary of each activity above. Many of these programs are tailored as train-the-trainer, meaning that one individual receives the training and then goes back to the farm to deliver it to many more employees. It can realistically be estimated that more than 3,000 employees have received food safety training as a result of this project. In addition, the materials developed through this grant have been reproduced with funding by the Mushroom Council and distributed to mushroom farms across the United States. From September 2010 to December 2011, 50 mushroom farm operations in Pennsylvania successfully passed a MGAP audit. This compares with 16 from the previous 12-month period. These farms are able to provide documentation to their packer/shipper of an established food safety program. These packer/shippers provide this information to their retail and foodservice customers, which are more frequently making this documentation a requirement of the sales contract. On a larger scale, all workers receiving training have a broader understanding of food safety that they can not only utilize in the workplace, but in their daily lives as well.
Lessons Learned:	The informal survey of the industry in the summer of 2011 provided useful feedback on grower attitudes and needs. Information was gathered though individual farm visits, which is excellent way to get honest and thoughtful opinions. We plan to continue this process.

	Adding a Flip chart and DVD to the set of training tools was a very positive outcome. Growers now have a variety of materials that can be interchanged to keep training new and fresh. Translation from English to Spanish continues to be a challenge. Making sure the translation was done properly was a lengthy process and requires involvement of the local Spanish- speaking workers. Not surprisingly, growers are resistant to change and prefer to continue with the MGAP Standards as written, particularly now that they have several years of experience with it. Interest in converting to a MGAP Standard applicable to all species or the Harmonized GAP was very low. Once the rules of the Food Safety Modernization Act governing produce safety are published, interest in revising the MGAP Standard to adapt to the new rules may increase. The value of the educational and training materials produced through this and previous Specialty Crop Block grants was noted at the USDA/FDA Food Safety Alliance conference in June 2011. The mushroom industry food safety initiative was one of only two commodity programs chosen as examples of how a commodity specific program can be successful. As a result, a number of other commodity programs have emulated our strategy and training materials.
Problems and Delays:	During 2011, mushroom growers faced serious challenges in finding adequate raw materials (such as hay, straw, peat moss). These materials as well as other production costs continue to rise. The food safety program has become a well-accepted practice at the majority of farms, but economic issues have been front and center in growers' minds. As noted from the grower insights collected during the summer of 2011, they are satisfied with the program, but did not feel like this was the appropriate time for changes. As noted above, accurate Spanish translation is a time consuming effort. Discussions were held regarding the Harmonized GAP audit, but growers noted their preference to stay with the MGAP program. In addition, there has been difficulty in getting growers and auditors to focus on conducting a pilot of the proposed MGAP audit that would cover both Agaricus and specialty mushroom production.
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Additional Information:	AMI continues several avenues of communications to growers regarding the food safety initiative. These include articles in the Mushroom News, presentations at Mushroom Council meetings, target email alerts, a booth at the Penn State Mushroom Industry Conference and updates at industry meetings, such as pesticide credit courses.
Project Title:	**Philly Farm to School: Transforming School Meals, Project 5**
Project Summary:	*Eat Fresh Here,* the Philly Farm to School Program, has successfully completed its year-long program, and has been instrumental in helping to inform the 2011-2012 school year. This project functioned as a close

	partnership between the School District of Philadelphia, Fair Food, The Food Trust, and the Philadelphia Urban Food and Fitness Alliance (PUFFA). Having completed a one-year 5 school farm to school pilot program during the 2009-2010 school year, the District's Division of Food Services (DFS) aimed to expand the program for the 2010-2011 school year to twenty-five sites. These 25 schools purchased fresh, healthy, locally grown specialty crops for use in school meals throughout the year. The project partners, including The Food Trust and the Philadelphia Urban Food & Fitness Alliance, with Fair Food acting as the lead, provided critical support, technical assistance, and trainings to DFS administrators and cafeteria staff, while developing youth marketing and messaging campaigns. The timing for this project was ideal. Having a year of piloting this program under its belt, and having established good relationships with community partners, DFS was ready to take this step and the project team was ready to scale up their support role. Additionally, the national momentum and movement around farm to school efforts highlighted not just to need to keep Philadelphia at the fore, but provided a platform and context to the program, for those new to the farm to school world. For additional information, please see the attached/enclosed year-end report compiled by Fair Food and the project team, and presented to the School District of Philadelphia.
Project Approach:	Collaboration was the key to a successful year of Eat Fresh Here. The project team, in close coordination with the School District of Philadelphia's Division of Food Services provided a series of marketing tools, technical trainings, site visits, and surveys to the 25 participating schools. The project team approached the work as a three-pronged effort as follows: 1. Training, Engagement, and Empowerment of Food Service Professionals: The project team kicked-off our Farm to School program, Eat Fresh Here in early September, as we participated in the Division of Food Services Opening Day. This brief program overview, as a part of the 2¬day District kick-off meeting, primed cafeteria staff for the program elements to come and introduced them to critical project team members. On September 21, DFS cafeteria managers, administrators, community stakeholders and youth joined the project team for a day-long farm tour. The group visited two specialty crop growers giving cafeteria staff, youth, and community partners the opportunity to tour the fields, talk with the farmers about their products and practices, and to make a lasting connection to the source of the farm fresh fruits and vegetables they would soon serve to their students across the city. Approximately 40 School District of Philadelphia employees attended, as well as youth representatives from 2 *Eat Fresh Here* schools, the project team, and other collaborators. The total number of farm tour attendees was 65. Additional technical training sessions were held throughout the fall: October 6, 2010: A Farm to School and "local foods 101" introduction and hands-on knife skills training session for all cafeteria managers was held at one of our Eat Fresh Here sites. This session included nutrition education for managers to better engage students about the specialty crops being served, and included distribution of marketing materials. Professional chefs provided knife skills training, safety tips, and prep techniques. Attending this first hands-on training were all 25 Eat Fresh Here school cafeteria managers, 4 project team members, 5 DFS field supervisors, and the Director of Operations for the DFS. In total, 34 people attended this training. October 20, 2010: Food services staff gathered for a hands-on cooking demonstration for late fall products, nutrition education, and information on marketing fresh healthy foods to youth in their cafeterias. Every manager from each of the 25 Eat Fresh Here sites attended this training, as well as 2 DFS field supervisors, 2 union representatives, and 4 project team members, totaling 35 attendees. November 2, 2010: Cooks from Eat Fresh Here sites gathered for a refresher on the program. This session served as a forum to discuss challenges and successes of the program thus far. Cooks were surveyed about their program impressions, product knowledge, and overall thoughts on the success of implementation of the

program at their respective sites. Twenty of the 25 Eat Fresh Here schools were represented by their cooks at this training session. The other 5 lead cooks were attending additional ServSafe training during the session. Also in attendance were 5 project team members and the Director of Operations for the Division of Food Services. In total, 26 people attended this training.

May 17, 2011: The project team gathered together food services staff one last time to express appreciation for the extra efforts those had put in to washing, chopping, and preparing the many fresh local foods served in the schools since the previous September. Food services staff received an Eat Fresh Here cookbook, which contained their own original specialty crop recipes on a family-sized scale. These recipes were also converted to 100 portion serving sizes and programmed into OneSource, DFS's inventory, ordering, and menuing software. Attending this final session were 45 cafeteria managers and cooks, 10 field supervisors, 5 project team members, and the Director of Operations for DFS. In total, 60 people attended this year-end gather.

Ongoing Support: Each Eat Fresh Here school also received an average of an additional 5 site visits by project team staff. These site visits promoted better communication, allowed for regular surveying of cafeteria staff for evaluation purposes, and provided the opportunity for the project team to see the program in action on a regular basis. In total, approximately 125 sites visits to individual schools took place throughout the school year.

Finally, monthly e-newsletter developed and distributed by project team members to cafeteria staff, DFS administrators, school principals, nutrition educators, farm to school and sustainable agriculture stakeholders, funders, and other interested parties. These newsletters included program updates and information, nutritional information about specialty crops, updates on national policy and legislation related to the National School Lunch Program, growing conditions, farmer profiles, and other relevant and timely topics.

2. Food Procurement, Healthier Options, and Systemic Change: Having successfully executed a 5-school pilot program during the 2009-2010 school year, the Division of Food Services within the School District of Philadelphia, made the decision to expand the program to 25 schools for the 2010-2011 school year. This marked an important turning point in the conversation around bringing more healthy specialty crops to more schools: instead of outside forces making things happen, DFS committed on their own to a major expansion, to nearly $100,000 of specialty crop purposes, and to internally facilitating the program. School meal change, especially in terms of food contracting and procurement, is often a slow process, rife with challenges, however, this transition of program "ownership" marked a new phase of farm to school in Philadelphia.

Over the course of the 2010-2011 schools year, cafeterias purchased specialty crops ranging from sweet corn, to collards and kale, to peaches and asparagus. In particular, Eat Fresh Here sites purchased and served a wide variety of lettuces, greens, and other salad-friendly vegetables available to them, and many reported very high sales of these colorful salads. The total number of pounds of specialty crops purchased by the District from September 2010-May 2011 was 60,595, which equates to about $65,000 in sales figures for these foods.

Report on Specified Goals:
Goal 1: To support Pennsylvania specialty crop growers through the purchase and consumption of specialty crops by the School District of Philadelphia. Benchmark: Sales of PA specialty crops to the School District of Philadelphia. Target: Increase in sales of 50% by June 2011, compared to sales of PA specialty crops in June 2010.
Achievement: In June 2010, sales across 5 program sites equaled $8,242 of specialty crops for 6 full months (Sept-Dec and Apr-May). Had there been 25 schools in the program, presumably, about $41,210 of specialty crops would have been purchased during that year.

Comparably, in June 2011, twenty-five schools had spent $65,017 on specialty crops. This represents about a 47% increase in specialty crops from 2010 to 2011. We are pleased with this outcome, even though it fell about 3% short, and believe the high prices faced by the DFS in the spring accounts for somewhat smaller orders than we had initially anticipated.

Note: In order to ensure that the funds internally allotted in the District were spent on specialty crops, the project team received twice-monthly sales updates which included detailed listings of every product purchased, case sizes, case prices, case counts, and to which school an order could be attributed. Additionally, the Division of Food Services had renewed its contract with its specialty crop purveyor, which specifies edible crops for purchase and lists every product the District may purchase ranging from Pennsylvania apples, to zucchini. There were no commodity foods or crops in the original RFP, nor in the final contract. The project team leader, Deborah Bentzel, had assisted the District with their initial RFP in 2009 to that end and will, for the upcoming 2012-2013 year, work again with the DFS around using geographic preference language as they go to bid for local specialty crops once again. The School District of Philadelphia, like most large urban districts, chooses to use its commodities allotment on “center of the plate” proteins, and otherwise contracts out all of their other grocery needs. Finally, because the initial RFP for local food purchasing (under the small purchasing threshold) was approved by the governing body of the District, the School Reform Commission, the DFS reported back their spending’s to that body.

Goal 2: Increased consumption of PA specialty crops by school-aged youth in Philadelphia schools. Benchmark: Types and amounts of PA specialty crops served in schools for school year 2010-2011. Target: Increase of 50% consumption of PA specialty crops of all types by district youth in the 2010-2011 academic year, compared to the 2009-2010 school year.
Achievement: During the 2010-2011 school year, 60,595 pounds of specialty crops were purchased and delivered to 25 sites in the program. The project team was unable to standardize assessment of servings across sites. However, the team did survey each cafeteria manager 3 times throughout the course of the school year and qualitatively, we understand that some specialty crops were more popular than others, and that overall, cafeteria managers did not report much postprep waste (wasted prepared servings).

Goal 3: Plan for sustained purchase of PA Specialty Crops by School District of Philadelphia for future years. Benchmark: Development of policy and/or procurement language for sustained purchase of PA specialty crops. Target: Commitment / policy change to systematize purchase of PA specialty crops into total food procurement into procedures for coming years.
Achievement: Procurement language and specification standards were discussed in June of 2011, as several DFS administrators learning much more about local food procurement on a granular level, from their counterparts at the annual School Food FOCUS meeting, in Denver, CO. Project team members provided DFS with streamlined RFP language, and an easily navigable layout of the newly released guidelines around geographic preference and bids for locally grown produce, like PA specialty crops. The DFS continues to craft new bid language for a large purchase (beyond their current small purchasing threshold agreement) in order to reach more of their schools in the coming years.

Other systemic changes of note include the streamlining of the ordering and menuing processes at the Division of Food Services, in order to better incorporate local food into daily cafeteria operations. The programming, restructuring, and communicating with IT staff, cafeteria staff and the project team about these changes resulted a long-term, District-driven approach to long-term incorporation of farm fresh specialty crops into school meals.

Now having entered the 2011-2012 amid exceedingly difficult budgetary times, the Division of Food Services remains committed to farm to school procurement of specialty crops and have committed 26 schools to the program through June 2012, with the intent of adding schools to the program over the next several months. Ordering systems are in place, trainings for cafeteria staff are forthcoming, and specialty crop items will be routinely incorporated onto cycle menus.

Two favorable, though unanticipated outcomes include the coordination of Eat Fresh Here with two existing programs taking place across many city schools. The establishment of adult and youth-led wellness councils in many of the farm to school sites made it possible to begin to better connect both youth and adult leaders with positive changes to school meals. Similarly, the District's nutrition education program granted access to their educator team, in order to better connect those classroom-based nutrition lessons to Eat Fresh Here in the cafeteria. The project team continues to explore ways we can continue to build on these alliances to best promote specialty crops to students.

3. Specialty Crop Promotion & Education: Marketing and promotional efforts for Eat Fresh Here included:

1 Sets of 5 posters, each promoting a seasonal specialty crop with the tagline: "Your cafeteria is working with local farmers to get the freshest, most delicious fruits and vegetables, like, eggplant (e.g.) for your lunch." See enclosed / attached version for reference.

2 Farm to School point of sale cards for promoting specialty crops on the cafeteria line.

3 Spring Seasonal Produce Guide: a tool for cafeteria staff to better understand varieties of fresh, local foods available in the spring months, how they should be stored, prepared, and presented (e.g. swiss chard, kale, spinach). See attached / enclosed version for reference.

4 Youth-led text messaging campaign about healthy fresh foods, and choosing wisely on the lunchline.

5 Youth-generated PSA's and other messaging for use on District LCD monitors. Unfortunately, these monitors were not programmed in time for use during the 2010¬2011 year, however, the cache of video clips and static messages have provided a readymade library of content for use during the 2011-2012 to continue to promote the consumption of healthy specialty crops.

At the crux of the success of this year of Eat Fresh Here is the collaboration among partners. Project partners included Fair Food, the School District of Philadelphia's Division of Food Services, The Food Trust and the Philadelphia Urban Food and Fitness Alliance (PUFFA). And additional outside collaborator was Common Market Philadelphia, the contract local foods wholesale distribution business. Roles and contributions of these partners are as follows:

- Fair Food: Overall convener of project team. Coordinated all major activities, coordinated project team meetings and tasks for team members, gather information, tools, and materials, set and met program goals, coordinated events and trainings.
- Division of Food Services: Implemented program in daily operations provided platforms for project team/cafeteria staff communications; provided project input, suggestions. Adapted menuing, ordering, inventory software, and recipe software to accommodate local foods vendor. Provided meeting spaces and overall general support.
- The Food Trust: Provide overall program support, nutrition education resources, tools, and language, nutrition educator coordination, and regional and national support and communications as the Mid-Atlantic Regional National Farm to School Coordinating Agency.
- PUFFA: A citywide multi-agency and community-driven project designed to advocate for systemic change to school meals, community food security, and healthy places to recreate and exercise, PUFFA was integral to bringing youth to the table. PUFFA's youth-led, youth-driven approach to effecting change allowed for youth to design their own text messaging campaign, provide PSA's on healthy eating, and to be generally engaged around good school food and farm to school programming.

	• Common Market: Common Market provided specialty crop products and logistics as an aggregator / distributor serving the Philadelphia region. Common Market is a mission driven, non-profit business supporting 100 local farms in the region, and is now in its third year of supply the fruits and vegetables for this program.
Goals and Outcomes Achieved:	Short-Term Goals & Outcomes Achieved: 1. Directly increase SDOP purchase of fruit and vegetable specialty crops and increase consumption among approximately 20,000 students in 20 School District of Philadelphia high schools—quadrupling this farm-to-school pilot program from the current year. Activities: Trainings, support, marketing, equipment purchasing and distribution. Outcomes: Over 60,000 lb of specialty crops (about $65,000) purchased and served to students in 25 cafeterias located across the City of Philadelphia. 2. Inform and educate students about the benefits and nutritional qualities of these specialty crop fruits and vegetables, and provide simple tips for preparing and enjoying these foods. Activities: • Text messaging campaign promoting the consumption of fresh healthy foods in the cafeteria and in their communities, healthy eating in general, and farm to school. • Meeting with PUFFA youth in focused workshop to discuss specialty crops that grow in our region, how they grow and when, and how to best enjoy / prepare them. Also discussed growing methods, good food in schools and their communities, and how best to market healthy, fresh eating habits to their peers. • PUFFA youth gatherings included healthy cooking activities using specialty crops; farm to school team provided content and topics for these youth meetings / community cooking. • Distribution of Eat Fresh Here visual marketing materials to schools-posters, POS cards. • Development of static and video PSAs about healthy eating and good food choices by youth. • Outcomes: Over 50 youth engaged in gatherings discussing healthy foods and healthy eating with specialty crops; where to find specialty crops inside and outside school environment, and easy ways to prepare these foods. 3. Provide professional development for district cafeteria staff as they work with products previously unavailable to them and learn how best to clean, store, and prepare a wide range of specialty crops. Activities: Farm tours, hands-on technical training sessions, support visits, menu development, recipe development, resource development. Outcomes: 25 cafeteria managers and about 20 cafeteria lead cooks, 8 field supervisors, and other administrators received technical trainings, specialty crop production and nutrition education, and farm to school training. Long-Term Goals & Outcomes--Progress: 1. Help support and promote a more local and regionalized sustainable food system through local food purchasing of PA specialty crops by the School District of Philadelphia. Activities: Farm to School programming via creation of new value-chain relationships between farmers, aggregators, institutional buyers, and young consumers. Progress: As Eat Fresh Here enters its third year, relationships within this value chain continue to grow and strengthen. 2. Create long-term relationships between PA specialty crop growers and institutional food service buyers to further diversify income for PA specialty crop farmers. Activities: Facilitation of vendor-buyer relationship for farm to school purchasing. Progress: The Division of Food Services better communicating needs and volumes for Common Market, who in turn, can better work with farmers for product supply. 3. Create a sustainable program within the School District where food service professionals train each other, and local food purchasing becomes standard practice across a proportion of the schools in the district. Activities: Coordinated training sessions, report to Division of Food Services with recommendations. Progress: DFS has temporarily suspended leading training sessions due to major budget, resource, and staffing for this

	school year. Will assist project team with training space and gathering attendees, as in years past and intends to fold farm to school trainings into next year's orientation for staff. 4. Improve the quality, taste and appeal of school meals. Activities: Incorporation of greater variety of healthy, fresh, locally-grown fruits and vegetables into school meals. Progress: The sustained effort of the school district to continue to run this program, while leveraging it to meet their other "healthy school food" goals is a sign of progress towards long-term implementation of this program. 5. Introduce students to a variety of locally grown fruit and vegetable specialty crops and increase their consumption of these healthy foods, improving their nutritional status and health. Activities: Integration of PUFFA youth-led marketing efforts, meetings, and gathering into farm to school activities and goals. Progress: Farm to School content, activities and topics regularly a part of PUFFA meetings, youth gatherings, and integrated coordination with community convener agencies.
Beneficiaries:	*School District of Philadelphia's Division of Food Services:* This project was designed to provide technical services to support DFS's farm to school purchasing program. Facilitation of this program elevated the District's presence in the farm to school movement, provided positive press opportunities, and most importantly, with support from partners, ensured the program's "back of the house" success. *Fair Food:* Fair Food was established with a mission of preserving farm viability in the region and to bringing more good local food to more eaters in the region. This program readily fulfilled Fair Food's mission, allowed us to expand our Farm to Institution programming, and more readily connected us with farm to school stakeholders across the region and the nation. *The Food Trust:* As Regional Lead Agency for the National Farm to School Network, The Food Trust better fulfilled its role and goals associated with facilitating and promoting farm to school programs across the region. The Food Trust's mission to create more access to healthy foods in Philadelphia was also upheld with this program. *PUFFA:* The engagement of community convening agencies, community members, and especially youth leaders helped fulfill PUFFA's goals of improving the school food environment and educating and empowering youth to make healthy food choices. *Common Market (and their farmers):* Common Market's sales totaled over $65,000. Returning at least 65 cents of every dollar to their growers, Common Market's farmers also benefitted from having the DFS as a steady, weekly customer. *City of Philadelphia Students:* This farm to school program had the potential to reach up to 20,000 students across 25 schools throughout the year. Cafeteria managers reported high sales of salads, hand fruits, collards, roasted sweet and red potatoes, and cabbage on a regular basis. In some cases, salad demand was difficult to meet as students sought out "those colorful salads." Diversifying food choices on the lunch-line was a goal of this program, and while not every student partook of the offered specialty crops, the project team and DFS is confident more fresh healthy foods were consumed by students in these 25 schools than in years past.
Lessons Learned:	Over the course of the 2010-2011 school year, Eat Fresh Here presented many learning moments. Positive lessons learned included a reinforcement of how critical professional development via technical trainings are to cafeteria staff for smooth project implementation. The project team found that most of the schools in the program were excited for this program to come to their school. While some cafeteria staff initially feared the additional prep time and skills necessary to make the program run, ultimately we learned from cafeteria staff that they enjoyed getting to work with a greater variety of fruits and vegetables, and that it was rewarding to have students ask for the freshest items. Additional lessons learned center themselves more firmly around logistics. The project team learned that required order minimums and case sizes, as set by Common Market, were occasionally difficult to reconcile. Managers reported difficulty using entire cases of certain items, especially cucumbers, yet DFS was unable to negotiate different case sizes with the vendor. The project team continued to learn of the great need for additional small wares in kitchens across the city. While the team purchases knife kits for each schools, the need for every tool from vegetable peelers, to

	additional cutting boards, to additional paring knives and colanders was very apparent. The project team, in our year-long report to the DFS made recommendations around the need for additional small wares for kitchens. Finally, the greatest lesson learned was how greatly economics impact operations for everyone on the value chain, but in the case of the School District of Philadelphia, how greatly deficits impact planning around programs like farm to school. The loss of resources faced by DFS this year is truly extraordinary. This year's Eat Fresh Here will look different than last years, but the commitment DFS has to this program is more evident than ever. Despite a bleak local and national economic climate, they have committed to purchasing local throughout the coming year, to supporting the region's specialty crop growers, to bringing more good fresh foods to their students, and to sustaining this program in the long-term.
Contact Person:	Fair Food, Deborah Bentzel, 1315 Walnut Street, Suite 522 Philadelphia, PA 19107, 215-386-5211 x 102 deb@fairfoodphilly.org

Project Title:	**Fayette Farm Market Development and Promotion Project, Project 6**
Project Summary:	Fay-Penn developed of four Fayette County Farmer's Markets and the Fayette County Buy Local Network in 2010. In 2011 we continued to develop the four (4) Fayette County Farmers Markets and developed two (2) new markets. That made a total of six (6) farmers markets for the Fayette County through the Fayette County Buy Local Network. In 2012 Fay-Penn maintained 6 markets for the Fayette County Farmer's Markets and the Fayette County Buy Local Network. In 2012 we continued to develop the six (6) Fayette County Farmers Markets and we planned to develop one more market but with the short fall of the farmers able to have produce we postponed development of the seventh market until 2013. That made a total of six (6) farmers markets for the Fayette County through the Fayette County Buy Local Network. The following six communities were identified for the farmer's markets for 2011 and 2012: 1. Ohiopyles Started in 2010 2. Uniontown Started in 2010 3. Masontown Started in 2010 4. Connellsville Started in 2010 5. Brownsville Started in 2011 6. Scottdale Started in 2011 We did hire 2 part-time contract positions for the six farmers markets for the 2011 season. The role was the managers would oversee the markets when open and work to identify other farm and vendors for the markets. **<u>Challenges</u>** As for problems, the only major problem would be continuing to recruit more farmers to the farmer's markets to assure that the consumers that come to the market have a selection of fruits and vegetables crops to choose from. We know that there is not much differentiation between our markets and other competitors. However, we did establish four farmer's markets in the county in 2010 and maintained the four and started two new markets in 2011. In 2012 we maintained the six markets and went to start the seventh but with the weather and not having more farmers we decided to hold off on the seventh until 2013. We are working with a number of groups and agencies in the county to help identify other farmers and we are also helping new farmers get started. We have worked with the backyard gardeners and have gotten a number

	of them involved and they stated that they were even going to enlarge their gardens for next year. We are also working with town of Greensboro, PA. They just started their farmers market and we can see how we can work with other farmers and have them at all the markets. We have been working with Fayette County Cooperative Extension and the Fayette County farm groups to also find other farmers that are producing fruits and vegetables.
Project Approach:	In 2011 we continued to develop the four (4) Fayette County Farmers Markets and developed two (2) new markets. That made a total of six (6) farmers markets for the Fayette County through the Fayette County Buy Local Network. In 2012 we maintained the six (6) farmers markets. We held a Buy Local Summit in September 2011 with over sixty five (65) people attending, in which we held workshops on production of fruits and vegetables and had workshops also that would help the consumer do home canning of the fruits and vegetables. In 2012 we held our second Buy Local Summit with over one hundred and ten (110) people in attendance and they learned about canning, business planning and marketing, gardening, energy conservation, cooking with local foods, and more. We were able to hire two (2) part-time contract positions for the six farmers markets for the 2011 and 2012 season. For the 2012 farmers markets season we expanded the season by two weeks in September. We finished the season the last week in September. Fay-Penn also drove consumer traffic by using the Fayette County "Buy Local Program." This was done in the 2011 and 2012 season by offering the first 20 customers at each of the farmers markets a $5.00 voucher that could be used towards their purchases at the farmers market that day, just by presenting us with their Buy Local Cards. We also had our Buy Local Cards available for sale ($7.00 per card) at the farmers markets. The farmers/vendors simply turned the vouchers in to us at the end of the day for cash. The funding for the Buy Local voucher program was provided by Fay-Penn through their general fund, which amounted to $100.00 for each market or $600.00 per week for the entire season. For the 2013 season we are hoping to expand this program and we have asked for some funding from Farm Aid to match Fay-Penn funds that we have put in the program this year. That funding is pending at this time. We were thankful that throughout the farmer's market season, we had to cancel only one market due to inclement weather. We averaged 90 consumers per market. We were able to get a much better count of attendance with having a manager at each of the markets. We feel that the farmers markets were a huge success over the last two years and consumers are already looking forward to next year's markets.
Goals and Outcomes Achieved:	**<u>Objective 1: Sustain the current four (4) farmers markets and create two (2) new farmers markets.</u>** **We plan to continue supporting the current (4) farmers markets in four communities that began in April 2010 farm market season; Develop two new farm markets in 2011; and continue to provide managerial support to all six farm market throughout 2011. We also continue to support and develop the six farmers markets.** The market names, dates and times are as follows for 2011: 1. Brownsville Farmers Market — June 29th –Sept 14th — 4:00pm to 7:00pm 2. Downtown Uniontown Farmers Market — June 31th –Sept 15th — 4:00pm to 7:00pm 3. Masontown Farmers Market in the Park — June 24th –Sept 16th — 4:00pm to 7:00pm 4. Scottdale Farmers Market — July 1st – Sept 16th — 5:00pm to 7:00pm 5. Connellsville Farmers and Art Market — July 3rd –Sept 4th — 8:00am to 12:00pm 6. Ohiopyle Country Market — May 29th – Sept 4th — 2:00pm to 6:00pm The market names, dates and times are as follows for 2012: 1. Brownsville Farmers Market — July 4th –Sept 26th — 4:00pm to 7:00pm 2. Downtown Uniontown Farmers Market — July 5th –Sept 20th — 4:00pm to 7:00pm 3. Masontown Farmers Market in the Park — July 6th –Sept 28th — 4:00pm to 7:00pm 4. Scottdale Farmers Market — July 6th – Sept 21st — 4:30pm to 7:00pm 5. Connellsville Farmers and Art Market — July 7th –Sept 22nd — 8:00am to 12:00pm

6. Ohiopyle Country Market May 26th – Aug 25th 2:00pm to 6:00pm

<u>Objective 2: Create a plan to develop and implement Fayette County's Regional Agriculture Infrastructure:</u>
Hold three sustainable farming and community workshops. This educational training will gather farmers and businessmen to support the aims and benefits of a sustainable farming and farmers markets network; Develop an assessment of the demand for the type and volume of local product wanted by consumers and local restaurants, wholesalers, grocery stores, etc. and relay that information to local farmers to have these products readily available at the local farmers markets; and Develop an assessment of what products are already being produced by local farmers to determine what additional products could be produced to increase their profitability.

We had a total of 9 workshops at the 2011 summit. We had three workshops for the farmers. The first one was on Native vs. Non-native plants & seasonal gardening. The second one was Local Winemaking 101. The third was on self-watering systems for farmers and backyard gardens. We also had a workshop on how to preserve the food that you buy from the farmers market or directly from the farmers. I attached the handout of the summit for you.

We had a total of **21** workshops at the 2012 summit; 11 workshops for farmers and 10 workshops for consumers. The 2012 Buy Local Summit will offer area farmers residents, educators, students, and others information on all things local. Participants will learn about canning, business planning and marketing, gardening, energy conservation, cooking with local foods, and more.

Workshop Session 1 Canning after Harvest; Community Supported Agriculture; Foraging for Wild Edible Plants; Business Planning 101; Gardening 101 & Composting; Sourcing Local for Restaurants and Small Businesses; Marcellus Shale & Our Natural Water Source **Workshop Session 2** Freezing & Drying after Harvest; Regional Food System; Cooking with Seasonal Foods; Outdoor Recreation; Energy Conservation; Value of Marketing Your Farm/Business; Marcellus Shale: Know Your Rights **Workshop Session 3** Canning after Harvest; Outdoor Recreation; Cooking with Seasonal Foods; Gardening 101 & Composting; Energy Conservation; Value of Marketing Your Farm/Business; Marcellus Shale: Know Your Rights. I attached the hand out of the summit for you.

<u>Objective 3: Continue to develop and implement a marketing plan for the farmers markets that have locally grown fruits and vegetables through a county-wide marketing campaign:</u>
Develop and distribute a newsletter on issues dealing with food supplies, safety, production and other issues. This newsletter will circulate on the following organizations' websites: Fay-Penn, Herald Standard Newspaper and facilitate the marketing of the six local farmers markets to consumers, local restaurants and grocery stories.

Fay-Penn established the *Fayette County Buy Local Campaign* at this time, and were able to further promote our four farmers markets through this campaign. We were fortunate to partner with our local newspaper "Herald Standard" and continued to develop a local newsletter. The "*Be Local Buzz"* newsletter is an insert in the Herald Standard Newspaper on the third Sunday of each month.

Fay-Penn also created a partnership with the local AM Radio Station "590 WMBS" in the City of Uniontown. The radio show is called "Locally Yours". It is a show that airs very Friday from 11:15 am to 12:00 noon. We talk about the local economy and spent time in each show promoting locally grown fruits and vegetables. Throughout the growing season we devote at least 15 min. of the show on the farmers and the farmers markets.

Fay-Penn has created a complete marketing plan. We developed one TV commercial that was aired on six cable channels in two regions. We developed one billboard ad and it was placed in two locations in the county. We developed radio spots which aired on WMBS-AM and FROGGY-FM. We did newspaper ads in the Daily Courier and the Herald Standard. We also produce banners and yard signs to help with promoting the Fayette County Buy Local Farmers Markets.

We have just launched a new website for the Fayette County Buy Local Network www.buylocalfayette.org. We

	are very excited about the new website and we are still posting information. This website will have all the information on the farmers markets and food and farm issues and eating healthy. We still need to continue the ongoing development of the website. **Objective 4: Increase numbers of consumers eating healthier, locally-produced fruits and vegetables:** **Develop a list of enthusiastic consumers interested in purchasing local produce; Develop public educational curriculum regarding sustainable community efforts, specifically in relation to local agriculture and including low-income consumers; Develop and distribute educational materials to consumers on the benefits of buying local farm products; and Promote the development of two local community gardens, and sell the products at six local farm markets.** We have developed a list of consumers interested in buying local fruits and vegetables. This was done at the farmers markets, the Fayette County Fair and other events throughout Fayette county we have over 2,000 names on this list. We have also developed and distributed educational materials to consumers regarding the health benefits of buying local farm products. We have passed out recipes at the farmer markets using fresh fruits and vegetables from the markets. We inserted information in the "Be Local Buzz" at the farmers markets and other events we attended in the county. We still need to do a better job of getting the information out on how to use and cook by using fresh fruits and vegetables to the consumer in the low income communities and families.
Beneficiaries:	The people that benefited from this project were farmers. We had four (4) different farmers attending our markets throughout the 2011 season and six (6) for the 2012 season. We average around 70 consumers for the season 2011 and 90 for the 2012 season. For the 2012 season we worked with the farmer venders at the markets we estimated that a consumer spent on average of $7.00 at the market. We averaged about 90 people and out of that 90 people 80 of them purchased from the farmers which we would have generated $560.00 in sales for the farmers per market. We are estimating for the total 2012 farmer market season that we made an economic impact on the local economy of over $36,960 for our local farmers. These are farmers that are raising specialty crops.
Lessons Learned:	One major lesson is not to develop or start a farmers market in a community that has no community volunteers or support. You need to have the commitment up front. We had one community that has asked for a farmers market but the community leaders did not help or support the market and it has been a real challenge to make it work. Another good lesson is to look at ways to offer incentives like the one that we did with the Buy Local voucher program (Buy Local Bucks). This was done in the 2011 and 2012 season by offering the first 20 customers at each of the farmers markets a $5.00 voucher that could be used towards their purchases at the farmers market that day, just by presenting us with their Buy Local Cards. Next lesson hold an annual summit on the value of producing and processing locally grown fruit and vegetables and what is the impact to the local economy when you do that. Another one to the development of the newsletter that is inserted in the local newspaper once a month that goes out to 18,000 local readers' homes and the development of a weekly radio show on WMBS 590AM (called *"Locally Yours")*this show reaches out to thousands of listeners daily. Lastly the big lesson is the need for a major marketing campaign to let people know to be able to access local farmers that produce specialty crops in our area.
Contact Person:	Robert C. Junk, Jr. 724-437-7913 bobj@faypenn.org
Project Title:	**Production, manipulation & marketing of Seascape Strawberries conducted by Linvilla Orchards, Project 7**
Project	The Seascape Strawberry is a relatively new day neutral strawberry introduction that has greater eating quality,

Summary:	yield and shipping ability than the standard tribute; tristar day neutral varieties. The objective of this project is to prove that the Seascape can be produced profitably during the months of July, August and possibly into September and October in the state of Pennsylvania. Through the management of the planting including the removal of flowers and the use of floating row covers. Strawberry production is constantly evolving. North Carolina became a serious producer of strawberries about 20 years ago with the introduction of plasticulture in combination with the floating row covers due to support from N.C. State University. Perfecting the production system of Seascape in a timely manner will position PA to be a significant supplier of strawberries to the entire east coast during the mid-summer to early fall season. The specific problems to be addressed by this project are determining the ideal planting dates; how long the flowers should be picked off to manipulate the ideal picking dates and how does this impact cost and effect yield. Finally I would like to experiment with when to apply row covers in order to produce quality fruit into the fall. The project is timely because the only place I've heard where there has been significant plantings is in Canada, south of PA is too hot to grow strawberries on plastic in July & August, so if PA gets in the game now on a large scale the Seascape Strawberry and PA will be recognized synonymously. That is the cornerstone to a successful industry, ie: Jersey tomato, Texas grapefruit, Georgia peach and so on.
Project Approach:	Seascape Strawberry plants where planted and maintained in seven, 6,000 plant blocks over a 2 year period of time from fall of 2010 through June 2012. The emerging blossoms were removed at varying intervals in order to determine the optimum cultural practices to provide the highest quality, most productive yields. The 1st season grossed $14,640.00/A and the 2nd season yielded $4,349.00/A., both years produced remarkably high quality fruit with excellent eating quality. The most notable controllable factor to the successful production of Seascape Strawberries is to keep a watchful eye on the population of two spotted-spider mites. Both seasons these insects were at a high pressure level and impacted crop yield. Cheryl Bjourson, Chester county extention and Scott Guiser, Bucks County extention were both very helpful in organizing a twilight fruit growers meeting here at Linvilla Orchards on July 12th, 2011 and July 12th, 2012. Both meetings were well attended and well received by local growers and growers from N.J. and MA. There were approximately 60 growers who attended these two meetings.
Goals and Outcomes Achieved:	The fields were meticulously maintained from planting through harvest with special attention to: flower, removal, runner removal, weed control, irrigation, fertigation, and deer control. The actual yields attained were considerably lower than our desired goal of at least 1 lb / plant. Attached are yield and crop valve records for 2011 and 2012 & the 2012. The 2011 season yielded .41 lbs/plant and the 2012 season yielded .12 lbs/plant. The cause for the decreased yield has been targeted and will be addressed in future plantings. The greatest yield reducing factor has been the reduction in plant vigor resulting from two spotted mite pressure. The greatest expense to production has been flower removal and weed control. The major successful outcome of the project is the positive response from our customers to myself and my staff, at our P.Y.O. stand and in comments to our social media sites. The reaction of local growers at our two twilight fruit growers meetings was also very positive.
Beneficiaries:	Nate Nourse; Nourse Farm strawberries told me he sold out of Seascape plants immediately after my presentation at the 2012 Mid-Atlantic fruit growers meeting where I presented my results from the 2011 growing season. I've spoken with Kurt Alstede, Alstede Farm, about our results and he put in a planting for 2012. The attendees of the twilight meetings were interested, Nate Nourse of Nourse farms has indicated that sales of Seascape plants are strong for the 2013 growing season. This project helped to bring attention to the potential for day neutral strawberry production in Pa. I will continue to perfect and promote the planting of Seascape Strawberries which will benefit a wide range of stake holders. This project has caused buzz, now we need to fruit to cause revenue.

	I feel if we can keep the momentum going the potential economic impact of the project could be in the millions of dollars. The beneficiaries would include farmers, farm markets, suppliers of irrigation pipe, plastic mulch, row covers, deer fencing and strawberry packaging. Our customers at Linvilla Orchards, who already benefited and continued consumer demand will be the greatest driving force to increased production.
Lessons Learned:	We feel greater yields can be achieved if we are able to keep the planting at an optimum over a longer growing period. Some of the greatest challenges were mites who can be controlled with timely application of miticides or predatory mites. Plus it is important to mention that mites came into the planting both seasons, starting from a dusty roadway along the edge of the planting; which could have been prevented simply by different sight selections. Weed control over such a big growing season is also a great challenge and I plan to work with different mechanical and chemical weed control methods. Two removals of emerging flowers seem to be the ideal economic number for both plant vigor and maximum yield. As a result the greatest lesson I've learned is that we should now turn our attention to the effects of staggered plantings, similar to what we do with tomatoes, possibly putting in a new planting every 14 to 21 days from April 1, to July 1. Overall it has been a great experience and we are very thankful to the PA specialty crop program for their support. We will continue our work with day neutral strawberries and hope to see them as an economic powerhouse in the future of PA Agriculture.
Contact Person:	Contact Person: Norman Schultz; farm manager Linvilla Orchards 484-576-3515 Norm@linvilla.com

Additional Information:

Yield + Crop Value Records for 2011				
	PYO		Wholesale	
Date	Weight in lbs	$ Value	# of 12 pint Flats	$ Value
6/18	138	$ 414.00		
6/22	238	$ 712.00		
6/29	218	$ 654.00	3	$ 90.00
7/2	209	$ 625.00	5	$ 150.00
7/6	89	$ 266.00	5	$ 150.00
7/7	94	$ 280.00	10.5	$ 315.00
7/8	44	$ 131.00	27.5	$ 825.00
7/9	168	$ 502.00	4	$ 120.00
7/10	3	$ 9.00		
7/13	87	$ 253.00	47	$ 1,410.00
7/14	161	$ 482.00		
7/15	140	$ 419.00	55	$ 1,650.00
7/16	342	$ 1,024.00	8	$ 240.00
7/17	273	$ 815.00	34	$ 1,020.00
7/18			10	$ 300.00
7/19	23	$ 68.00		
7/20	42	$ 127.00	21	$ 630.00
7/21	34	$ 99.00	20	$ 600.00
7/22	24	$ 71.00	65	$ 1,950.00
7/23	38	$ 115.00	6	$ 180.00
7/24	133	$ 398.00	20	$ 600.00
7/25	42	$ 125.00	30	$ 900.00
7/26	57	$ 169.00	2	$ 60.00
7/27	55	$ 165.00	43	$ 1,290.00
7/28	90	$ 269.00	5	$ 150.00
7/29	50	$ 150.00	10	$ 300.00
7/30	127	$ 381.00	15	$ 450.00
7/31	140	$ 420.00	10	$ 300.00
8/1	29	$ 88.00		
8/2	26	$ 78.00		
8/12	2	$ 5.00		
8/13	74	$ 221.00		
8/27	12	$ 36.00		
9/4	58	$ 173.00		
TOTALS	**3260**	**$ 9,744.00**	**456**	**$ 13,680.00**

Total lbs	
PYO	3,260.00
Wholesale	4,104.00
Total	**7,364.00**

Avg Yield Per Plant in lbs	
Total lbs	7,364.00
Total Plants	18,000.00
Avg Yield	**0.41**

Gross $ Avg Yield Per Plant	
Total Gross	23,424.00
Total Plants	18,000.00
Avg Yield	**1.30**

Total Gross $ Return	
PYO	9,744.00
Wholesale	13,680.00
Total	**23,424.00**

Avg Yield Per Acre in lbs	
Total lbs	7,364.00
Total Acres	1.60
Avg Yield	**4,602.50**

Gross $ Avg Yield Per Acre	
Total Gross	23,424.00
Total Acres	1.60
Avg Yield	**14,640.00**

Yield + Crop Value Records for 2012				
	PYO		Wholesale	
Date	Weight in lbs	$ Value	# 12 pint Flats	$ Value
6/24/2012	50.2	$ 150.00	0	$ -
6/26/2012	189.4	$ 569.30	0	$ -
6/28/2012	111	$ 331.87	0	$ -
7/2/2012	70.9	$ 212.00	0	$ -
7/8/2012	128.5	$ 384.21	0	$ -
7/9/2012	90	$ 269.00	0	$ -
7/13/2012	113.7	$ 340.00	0	$ -
7/14/2012	138.5	$ 414.00	0	$ -
7/15/2012	208.4	$ 623.00	0	$ -
7/16/2012	51.5	$ 154.00	6	$ 180.00
7/17/2012	46.5	$ 139.00	4	$ 120.00
7/18/2012	59.2	$ 177.00	4	$ 120.00
7/19/2012	78.6	$ 235.00	10	$ 300.00
7/20/2012	93	$ 248.00	8	$ 240.00
7/21/2012	260.5	$ 779.00	11	$ 330.00
7/24/2012	39.5	$ 118.00	12	$ 360.00
7/25/2012	147.2	$ 440.00	10	$ 300.00
7/26/2012	61.9	$ 185.00	10	$ 300.00
7/27/2012	36.8	$ 110.00	10	$ 300.00
7/28/2012	0	$ -	8	$ 240.00
7/31/2012	0	$ -	1	$ 30.00
TOTALS	**1975.3**	**$ 5,878.38**	**94**	**$ 2,820.00**

Total lbs	
PYO	1,975.30
Wholesale	846.00
Total	**2,821.30**

Avg Yield Per Plant in lbs	
Total lbs	2,821.30
Total Plants	24,000.00
Avg Yield	**0.12**

Gross $ Avg Yield Per Plant	
Total Gross	$ 8,698.38
Total Plants	24,000.00
Avg Yield	**$ 0.36**

Total Gross $ Return	
PYO	$ 5,878.38
Wholesale	$ 2,820.00
Total	**$ 8,698.38**

Avg Yield Per Acre in lbs	
Total lbs	2,821.30
Total Acres	2.00
Avg Yield	**1,410.65**

Gross $ Avg Yield Per Acre	
Total Gross	$ 8,698.38
Total Acres	2.00
Avg Yield	**$ 4,349.19**

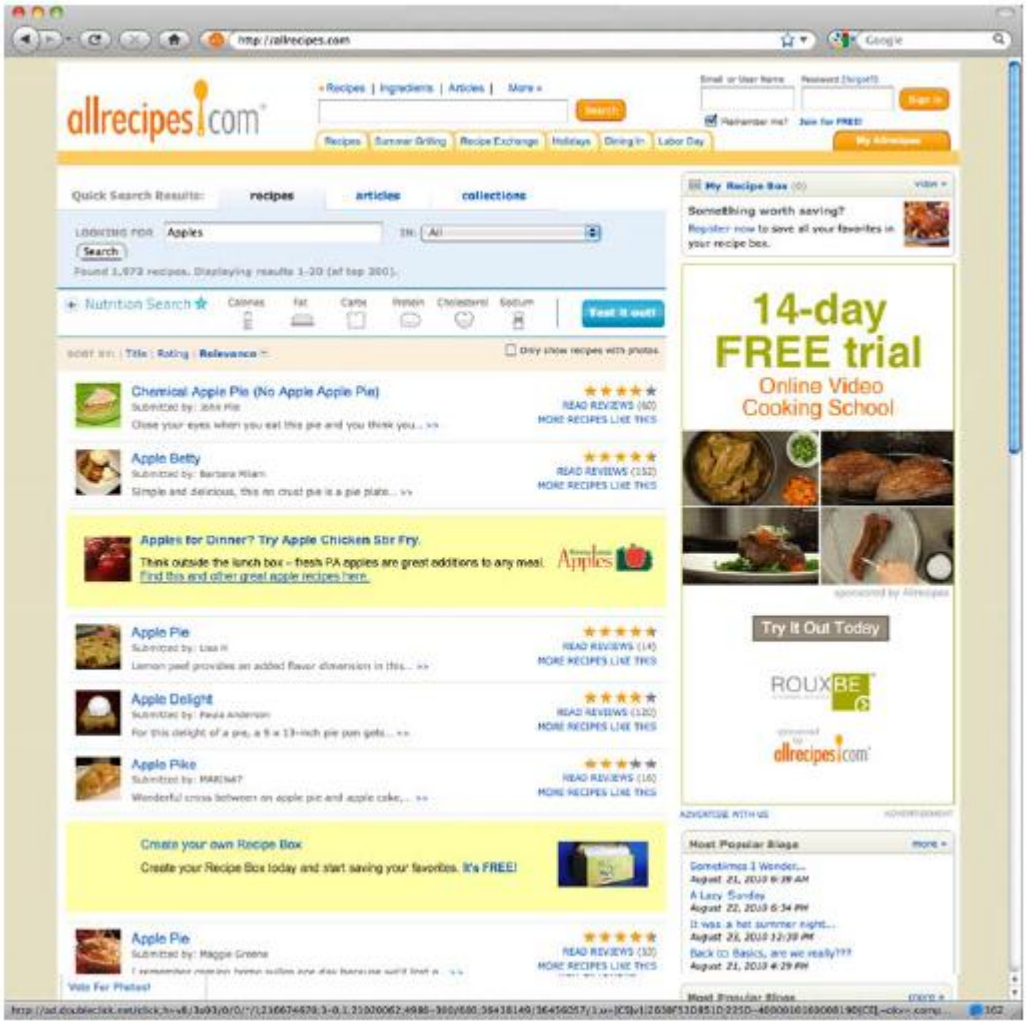
Project Title: **Farm Market Campaign for Pennsylvania Apples, Project 8**

Project Summary: This project included the expansion and execution of a Fall media campaign utilizing radio, outdoor, and online advertising to increase consumer awareness of Pennsylvania Farm Markets and to promote Pennsylvania Apples and apple products along with other *Pennsylvania Preferred* specialty crops. The two main objectives of this project were to promote consumer awareness of Pennsylvania Farm Markets and to promote Pennsylvania Apples and apple products.

The motivation was to help consumers be more aware of the many farm markets located throughout Pennsylvania and to use billboards as a visual marketing tool to direct consumers to their local farm markets along with the implementation of radio and web applications as other useful tools to promote Fresh PA Apples and apple products. The use of our point of sale materials and other marketing materials is added incentive to help educate the consumer about the many apple varieties Pennsylvania has to offer and to enhance the competitiveness of apple sales.

The Pennsylvania Apple Marketing Program (PAMP) staff worked closely with PPO&S (contracted marketing

	firm) to reach as much of the Commonwealth as possible with messages about local Farm Markets. We succeeded in covering 91% of the state using radio and outdoor media, and 100% of the state with online advertising. In planning the campaign, we focused first on the location of Pennsylvania's Farm Markets. Their locations determined radio coverage, and the positioning of outdoor boards along major routes in close proximity to as many Farm Markets as possible. All major growing areas had radio coverage, and we expanded the billboard campaign to cover three additional areas this year in Pittsburgh, Bedford, and suburban Philadelphia. The marketing campaign did not promote farmers markets, it promoted apples and was used to encourage consumers already on their way to that market to buy apples along with other purchases.
Project Approach:	Using the "Find Fresh" concept, we capitalized on the "Buy Local" trend, and encouraged consumers to find the freshest produce possible; from their local growers. Another element to this year's campaign was the addition of a mobile web site. Consumers had the ability to access the PennsylvaniaApples.org website with ease on their smartphones and mobile devices. In fact, 25% of all searches were done in this manner. The "Where to Buy" section of the website provided an opportunity to search for Farm Markets almost instantly upon receiving the message from either radio or outdoor boards. Users had the option of searching for markets based on location, or on a particular variety of apple they hoped to find. Variety information and recipes were also made available in a user-friendly format. The radio ad included mention of the new mobile website. (Graphic left) All of the media in the campaign was designed to drive consumers to the website to help them find their local farm markets and learn more about locally grown Pennsylvania Apples and other *Pennsylvania Preferred* products. Further development of the website allowed each member Farm Market to maintain their own profile online. Grower members were provided with a username and password that allowed them to log on and update their listing throughout the season. They could add or remove varieties based on what was available at their markets; they could adjust their hours of operation, provide additional contact information, even post pictures or advertise special events at their businesses. This gave the individual markets a chance to promote themselves, while providing an added convenience to customers. Statistics showed that 99% of markets listed received clicks from a search of pennsylvaniaapples.org. Online advertising with both www.allrecipes.com and www.foodnetwork.com included links to the www.pennsylvaniaapples.org website to increase our online presence. These websites were chosen because they are the top two women's lifestyle websites as well as the top two food websites. This was exactly what we were looking for to reach our target demographic, women ages 25-54. We ran large banner ads on the page as well as text links and search links. An example of a search link is provided below:



The ad campaign ran from September 12 – October 17, 2011. Here are a few highlights:

Radio

• 515 radio spots aired in 61 counties throughout the state from September 19 – October 9, 2011.

• The radio campaign covered 91% of the state.

Online

• Approximately 1 million impressions from September 12 – October 23, 2011.

• Generated approximately 4,000 clicks.

• 0.20% click-through rate – far exceeding the national average, and beating last year's numbers by 66%!

Outdoor

• 50 billboards posted in 13 counties from September 19 – October 16, 2011

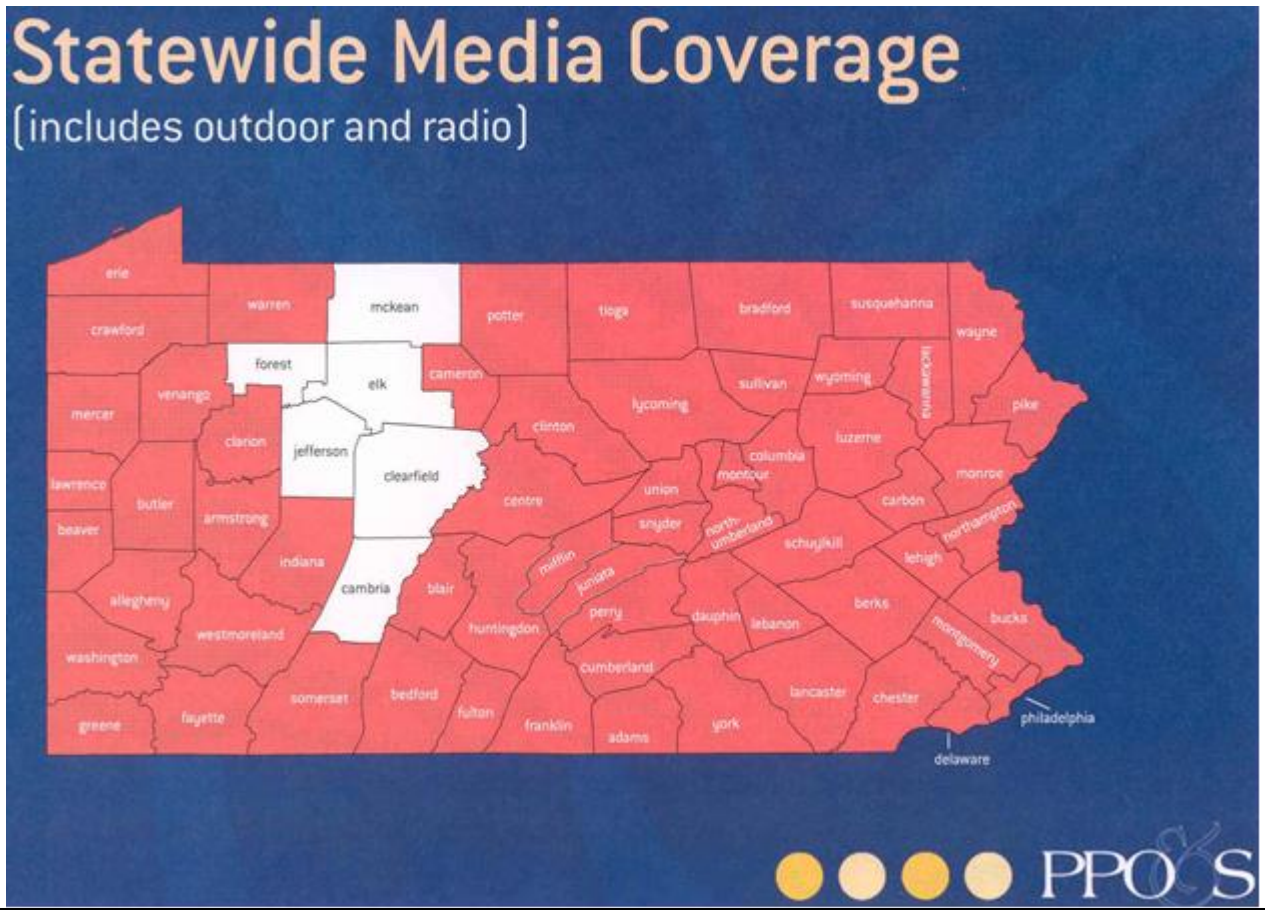
• Garnered a #25 showing (25% of the population in each area saw the boards)

Added Value

• PPO&S negotiated an estimated $19,000 in added-value opportunities. There are items that we received as a result of the media buys, at no additional cost. They included:

- 12 interviews on various radio stations (done by Karin Rodriguez)
- 16 additional billboards, which garnered at #25 showing over four weeks in five counties. Many remained in place through Mid-November.

Media coverage statewide for outdoor and radio covered 61 out of 67 counties in Pennsylvania. Coverage map

	is below: 
Goals and Outcomes Achieved:	The objective with all media placements - radio, online, and outdoor ads – was to generate statewide awareness and drive targets to the Pennsylvania Apple Marketing Board website. Web traffic increased significantly over the prior three month period, a clear indicator that our message was reaching consumers. In addition, website visits increased 54% over the same period in 2010. New statistics included a total of 2,304 searches for Farm Markets, and an impressive 99% of listed farm markets had clicks from the pennsylvaniaapples.org website. The chart below provides a more detailed comparison:

Monthly Visits & Visit Length

MONTH	VISITS	VISIT LENGTH
September 2010	7,913	121
October 2010	8,168	106
September 2011	12,876	104
October 2011	11,940	90

2011 had a 54% increase in visits over September and October 2010!

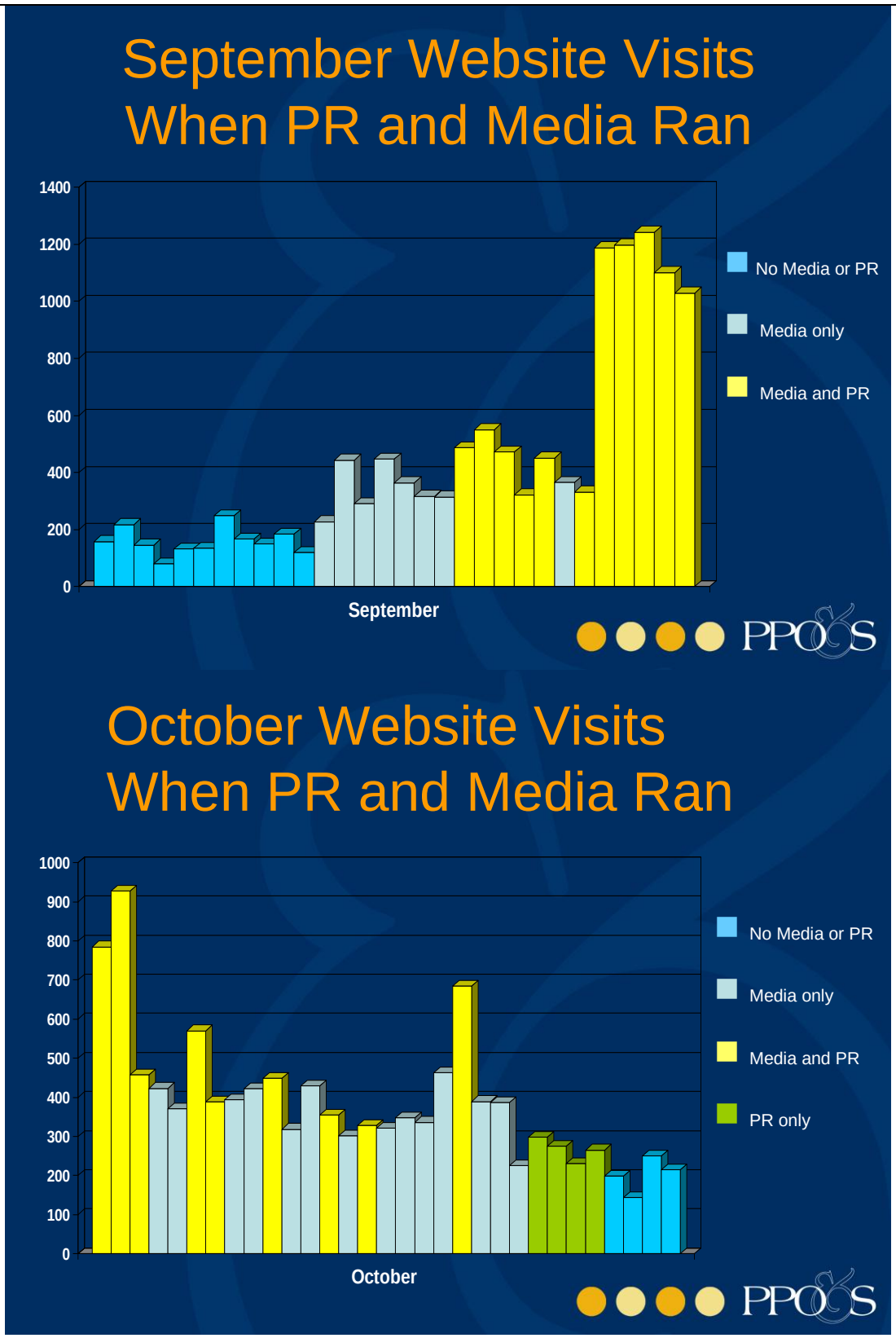
PPO&S

The top three pages on our website were:

1. Home page
2. Where to Buy – searchable list of Farm Markets
3. PA Apple Varieties

It should be noted that the Pennsylvania Apple Marketing Program also used our Public Relations campaign, also being run by PPO&S, to augment the "Find Fresh" campaign. We did press releases on the campaign to statewide media outlets as well as industry publications and we were successful in getting pickup from many daily and weekly newspapers. In addition, we did a live morning news broadcast on location at a Lancaster County Farm Market just prior to the launch of the campaign. In all instances, we were sure to promote the www.pennsylvaniaapples.org website.

The results of the PR campaign can be seen clearly in web hits from the days PR events were happening. See both September and October events below:



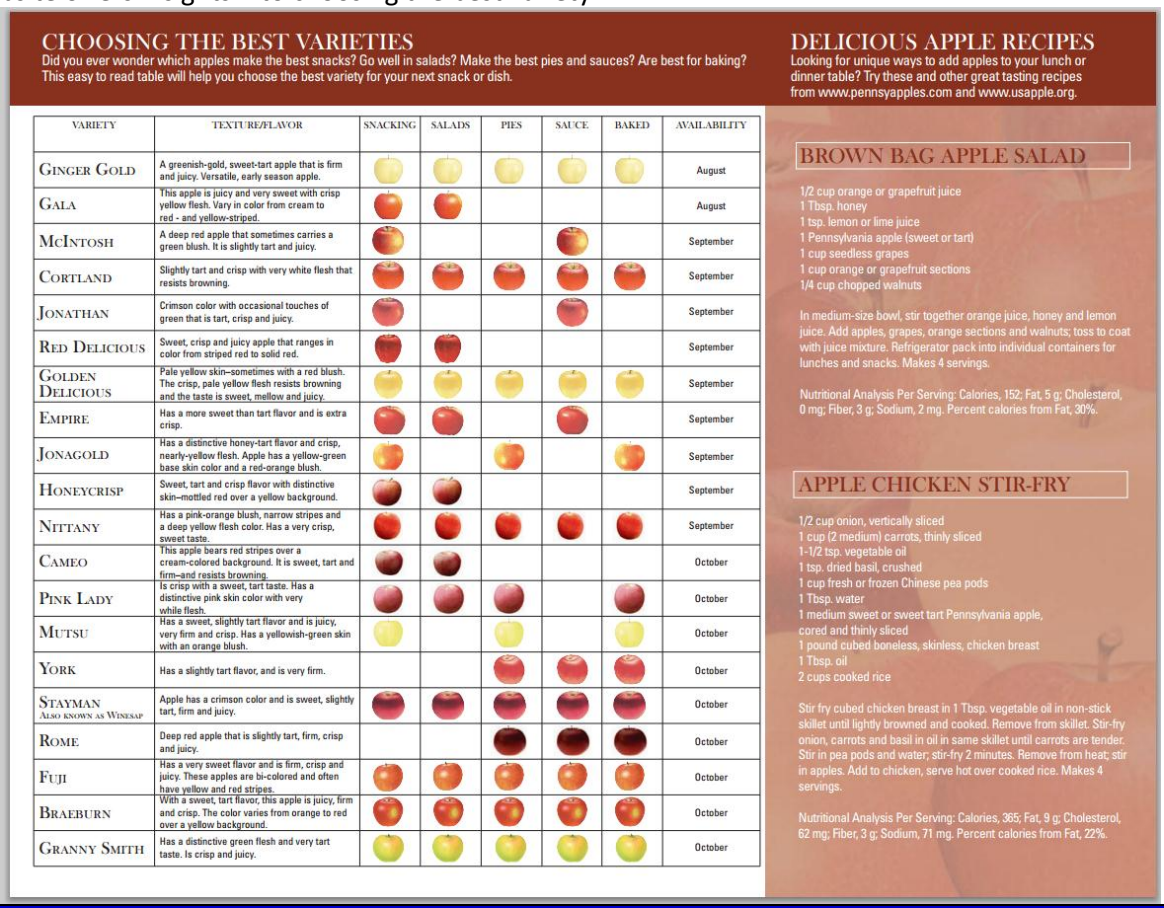
Beneficiaries:	Pennsylvania's 272 farms growing Pennsylvania Apple benefited from the promotional campaign and other

specialty crops indirectly benefited from the campaign. It has also been proven that our web visits were higher during the media and PR campaigns indicating that consumers are searching for local product which is helping to promote fresh apple sales. Pennsylvania Apples are valued at $66.5 million annually and Pennsylvania is ranked 4th in the nation among apple growing states.

Lessons Learned: In conclusion, the "Find Fresh" consumer marketing campaign has been a huge success for Pennsylvania's Apple Industry. This grant program has afforded us the opportunity to explore new options for promotion that have been cost-prohibitive to date for our growers. So far, the available statistics indicate that our message was received by consumers and that they were indeed searching for local markets on the www.pennsylvaniaapples.org website, with 25% of searches done via smartphones and mobile devices. The Pennsylvania Apple Marketing Board members, as well as our grower members are pleased with the success of the campaign, and we all look forward to continuing this fruitful endeavor.

Contact Person: Patty Wertz, Pennsylvania Apple Marketing Program, 2301 N. Cameron Street, Room 303, Harrisburg, PA 17110 www.pennsylvaniaapples.org

Additional Information: www.pennsylvaniaapples.org
The website offers insights into choosing the best variety.



CHOOSING THE BEST VARIETIES

Did you ever wonder which apples make the best snacks? Go well in salads? Make the best pies and sauces? Are best for baking? This easy to read table will help you choose the best variety for your next snack or dish.

VARIETY	TEXTURE/FLAVOR	SNACKING	SALADS	PIES	SAUCE	BAKED	AVAILABILITY
Ginger Gold	A greenish-gold, sweet-tart apple that is firm and juicy. Versatile, early season apple.	✓	✓	✓	✓	✓	August
Gala	This apple is juicy and very sweet with crisp yellow flesh. Vary in color from cream to red - and yellow-striped.	✓	✓				August
McIntosh	A deep red apple that sometimes carries a green blush. It is slightly tart and juicy.	✓			✓		September
Cortland	Slightly tart and crisp with very white flesh that resists browning.	✓	✓	✓	✓	✓	September
Jonathan	Crimson color with occasional touches of green that is tart, crisp and juicy.	✓			✓		September
Red Delicious	Sweet, crisp and juicy apple that ranges in color from striped red to solid red.	✓	✓				September
Golden Delicious	Pale yellow skin--sometimes with a red blush. The crisp, pale yellow flesh resists browning and the taste is sweet, mellow and juicy.	✓	✓	✓	✓	✓	September
Empire	Has a more sweet than tart flavor and is extra crisp.	✓	✓		✓		September
Jonagold	Has a distinctive honey-tart flavor and crisp, nearly-yellow flesh. Apple has a yellow-green base skin color and a red-orange blush.	✓		✓		✓	September
Honeycrisp	Sweet, tart and crisp flavor with distinctive skin--mottled red over a yellow background.	✓	✓				September
Nittany	Has a pink-orange blush, narrow stripes and a deep yellow flesh color. Has a very crisp, sweet taste.	✓	✓	✓	✓	✓	September
Cameo	This apple bears red stripes over a cream-colored background. It is sweet, tart and firm--and resists browning.	✓	✓				October
Pink Lady	Is crisp with a sweet, tart taste. Has a distinctive pink skin color with very while flesh.	✓	✓	✓		✓	October
Mutsu	Has a sweet, slightly tart flavor and is juicy, very firm and crisp. Has a yellowish-green skin with an orange blush.	✓		✓		✓	October
York	Has a slightly tart flavor, and is very firm.			✓	✓	✓	October
Stayman (Also known as Winesap)	Apple has a crimson color and is sweet, slightly tart, firm and juicy.	✓	✓	✓	✓	✓	October
Rome	Deep red apple that is slightly tart, firm, crisp and juicy.			✓	✓	✓	October
Fuji	Has a very sweet flavor and is firm, crisp and juicy. These apples are bi-colored and often have yellow and red stripes.	✓	✓	✓	✓	✓	October
Braeburn	With a sweet, tart flavor, this apple is juicy, firm and crisp. The color varies from orange to red over a yellow background.	✓	✓	✓	✓	✓	October
Granny Smith	Has a distinctive green flesh and very tart taste. Is crisp and juicy.	✓	✓	✓	✓	✓	October

DELICIOUS APPLE RECIPES

Looking for unique ways to add apples to your lunch or dinner table? Try these and other great tasting recipes from www.pennsyapples.com and www.usapple.org.

BROWN BAG APPLE SALAD

1/2 cup orange or grapefruit juice
1 Tbsp. honey
1 tsp. lemon or lime juice
1 Pennsylvania apple (sweet or tart)
1 cup seedless grapes
1 cup orange or grapefruit sections
1/4 cup chopped walnuts

In medium-size bowl, stir together orange juice, honey and lemon juice. Add apples, grapes, orange sections and walnuts; toss to coat with juice mixture. Refrigerator pack into individual containers for lunches and snacks. Makes 4 servings.

Nutritional Analysis Per Serving: Calories, 152; Fat, 5 g; Cholesterol, 0 mg; Fiber, 3 g; Sodium, 2 mg. Percent calories from Fat, 30%.

APPLE CHICKEN STIR-FRY

1/2 cup onion, vertically sliced
1 cup (2 medium) carrots, thinly sliced
1-1/2 tsp. vegetable oil
1 tsp. dried basil, crushed
1 cup fresh or frozen Chinese pea pods
1 Tbsp. water
1 medium sweet or sweet tart Pennsylvania apple, cored and thinly sliced
1 pound cubed boneless, skinless, chicken breast
1 Tbsp. oil
2 cups cooked rice

Stir fry cubed chicken breast in 1 Tbsp. vegetable oil in non-stick skillet until lightly browned and cooked. Remove from skillet. Stir-fry onion, carrots and basil in oil in same skillet until carrots are tender. Stir in pea pods and water; stir-fry 2 minutes. Remove from heat; stir in apples. Add to chicken, serve hot over cooked rice. Makes 4 servings.

Nutritional Analysis Per Serving: Calories, 365; Fat, 9 g; Cholesterol, 62 mg; Fiber, 3 g; Sodium, 71 mg. Percent calories from Fat, 22%.

Project Title: **Expanding Cooperative Extension Farm Food Safety Training, Project 9**

Project Summary: The main goal for this project was to support the Penn State Extension Good Agricultural Practices (GAP) program. Resources were requested to support educational activities that support the needs of Pennsylvania

	fruit and vegetable growers as they face new farm food safety regulations and buyer mandates for GAP compliance. Funds for this project were received on July 14, 2011 and expenditures and activities did not begin until November 4, 2011, which is after the end of this reporting period.
Activities Performed:	**Background:** The purpose of this project was to conduct farm food safety training and support to fresh produce growers in Pennsylvania. **Summary:** Project activities proposed in the grant application and actual achievements conducted during the period of the grant are shown in Table 1. Between October 2010 and September 2011, funds were not spent (see problems and delays). Once the funds were obtained, a former extension educator located in Lancaster County, Pennsylvania and with experience in GAP training, was hired on a part-time basis. From October 2011 through December 2011, the educator conducted telephone and face to face interviews of managers of cooperatives, produce auctions, and distributors in Pennsylvania to determine training needs for their growers. We focused on these marketing channels, known as food hubs, because we had not reached this group to a large enough extent in our earlier GAP training and we anticipated that they, as indirect markets, will be subject to FDA produce safety standards set forth in the Food Safety Modernization Act. A summary of training events follows. **Day-long workshops –"Keeping Fresh Produce Safe Using Good Agricultural Practices"** From January through July 2012, the educator worked in collaboration with local food hubs, which included 6 auctions, 3 cooperatives, 2 distributors, and 1 grocery store chain, to deliver 12 5-hr workshops in 8 counties trained 404 individuals throughout Pennsylvania and beyond. The primary developer of the curriculum was Dr. Luke LaBorde of the Penn State Department of Food Science. County locations and number attending these workshops were Berks (27), Franklin (28), Fulton (52), Lancaster (159), Lebanon (54), Lehigh (50), and Northumberland (26). Farmers from 37 Pennsylvania counties participated in addition to others from Maryland, West Virginia, New Jersey and New York of which 286 participants were plain sect (51%), 159 farmers (29%) were from Lancaster County, and 55 certified organic farmers. The educator and Dr. LaBorde co-presented a one-day training session for 9 PDA/USDA GAP auditors in State College, Pennsylvania. Evaluations for these workshops are provided in the Appendix to this report. **One-Hour Produce Food Safety Awareness Presentations** From January through April 2012, 5 one-hour GAP awareness presentations were presented to 72 participants at winter growing meetings. **GAP Food Safety Plan Writing Assistance** The educator followed up with assistance to a local foods distributor on a format for writing a general food safety plan that would set GAP standards for their growers. This plan was piloted over the growing season with farmers in Lancaster County. Face to face follow-up assistance on plan writing and review was provided to 13 farmers. We found that the level of follow-up assistance needed was strongly influenced by the demands of the buyers for written food safety plans or self-inspections. We anticipate this need to increase in the future as regulations and buyer mandates become more certain and consistent. **Good Agricultural Practices Mock Audit Twilight Meetings** In August and September of 2012, the educator worked collaboratively with the Pennsylvania Department of Agriculture to plan and present 3 mock audit training sessions. Partners in planning and publicity included 3 produce auctions and the Rodale Institute. The 2-hour twilight meetings were designed to help small scale produce farmers gain a better understanding of what to expect from a USDA third party Good Agricultural

	Practices (GAP) audit and learn to assess food safety risk on their farms. The educator fabricated a small, inexpensive hand washing station for demonstration at these meetings. From August through October of 2012, Dr. LaBorde and the educator have been working together to review the program and make improvements and updates to our recommendations, with particular emphasis on revising our materials to make them compatible with the new Harmonized Food Safety Standards developed by the United Fresh Produce Association.
Problems and Delays:	There were delays in receiving the funds. We received notice that our application was accepted on July 23, 2010. However the contract did not arrive until June 27, 2011. Although we accomplished much in the months that followed, we were not able to follow the schedule in the original work plan. Budget cuts and staff reductions within Penn State Extension have limited our ability to serve the entire state and we found it necessary to limit our trainings to the southern counties in Pennsylvania. Much confusion exists about who will be subject to FDA produce safety standards to be issued under the Food Safety Modernization Act. We are assuming that cooperatives and produce auctions fall within the indirect markets category and therefore will be subject to FDA regulations.
Future Project Plans:	This project required an extension until 6/30/2013 to reach its project goals. We will provide the full results in the final report for this project. We will continue to make improvements to our current materials and make adjustments so they are compatible with Harmonized Food Safety Standards developed by the United Fresh Produce Association. We anticipate that FDA draft produce safety standards will be released in the coming months, and we anticipate that this will be an important part of our 2013 curriculum.
Contact Person:	Pennsylvania State University Luke LaBorde 202 Food Science Building, University Park, PA 16802 Phone: 814-863-2298 E-mail: lfl5@psu.edu
Additional Information:	Rcvd Extension 9/30/2012 Table 1. Project activities proposed in the grant application and actual achievements conducted during the period of the grant.

Project Activity (ME 44102199)		
Proposed		**Actual**
Project Activity	**Month**	**Activity**
Seek Extension Educators interested in participating and meet with regional and county extension (already in progress)	Oct 2010 – Dec 2011	No activity until funds available to hire an educator in October of 2012.
Conduct Program Team meetings in-services to train educators on GAPs and to plan GAP training session in winter training events. Conduct regular webinar training to	Nov 2011 – May 2012	Needs assessment conducted. Planning sessions for winter 2013 GAP workshops. One-day GAP training workshops, short presentations, and follow up assistance

program team and to educators outside the program team who may deal with food safety issues. Article on selected GAP topics will be included in Cooperative Extension newsletters		activities conducted.

Appendix

Evaluation summary for 2012 GAP workshops.

Participants were surveyed before and after each of the one-day workshops held between January and April of 2012. Changes in knowledge, confidence in skills, and future intentions are summarized.

Knowledge questions. Of the 236 respondents, 168 (71.2%) answered all of the questions (see Table 1 for questions and responses). The overall mean score increased by 1.50 from the mean of 6.55 (out of 10) before the workshop to 8.05 after the workshop. This is a strong indication that the participants learned new concepts during the trainings.

The largest difference in correct responses before and after the workshop occurred for the question regarding fresh fruits and vegetables as the primary cause of food-borne illnesses. Correct responses increased from 48.2% before the workshop to 96.4% after the workshop, which was a difference of 48.2% (Table 1).The second largest difference of 36.3% in correct responses was for the question related to the necessity to fully enclose packing areas, which rose from 45.8% before the workshop to 82.1% after the workshop. Increase in correct responses also occurred for the question regarding hand sanitizer sprays as acceptable substitutes for hand washing. Correct responses increased from 61.3% before the workshop to 96.4% after the workshop. After the workshop, a 23.3% increase in correct responses occurred for the question regarding testing of irrigated water from ponds for microbes. In addition, a 19.0% increase in correct responses was observed for the question on the need to thoroughly dry hands after hand washing.

Correct responses decreased between before and after the workshops for three questions. The largest decrease (13.1%) in correct responses occurred for the question regarding the safe application of manure-based compost. Correct responses declined from 65.5% before the workshop to 52.4% after the workshop. For the question on the FDA Food Safety Modernization Act, correct responses decreased from 70.8% before the workshop to 58.9% after the workshop for a difference of 11.9%. After the workshop, a decrease of 7.1% in the correct response was observed for the question related to restriction of animals entering to the field. Correct responses declined from 65.5% before the workshop to 52.4% after the workshop.

Confidence in skills questions. Of the 236 survey respondents, 169 (71.6%) responded both before and after the workshop to the items measuring participants' confidence in GAP skills (Table 2). After the workshop, 109 (64.5%) respondents reported that they were either confident or very confident in writing a food safety plan, an increase of 44.9% from before the workshop (Figure1). Of the 169 respondents, 63 (37.3%) were either confident or very confident in conducting a food safety self-inspection before the workshops, which increased by 35.5% to 123 (72.8%) after the workshop (Figure2). After the workshops, 91 (53.9%) respondents were either confident or very confident in preparing for a third-party audit, an increase of 34.4% from 33 (19.5%) before the workshop (Figure 3).

Future intentions. After the workshop, respondents indicated their intent to implement specific GAP activities (writing or updating a food safety plan, conducting a food safety inspection, and performing a third party audit) for the 2012 growing season (Table 3). The majority of respondents, (52.1%) indicated that they intended to

	write or update a food safety plan, and 64.5% indicated their intent to conduct their own food safety inspection. However, only 21.1% respondents indicated that they would have a third-party audit conducted on farm. **Conclusions:** These food safety workshops were organized to provide participant growers the knowledge and skills needed to comply with and verify GAP standards. Surveys evaluated growers' change in GAP knowledge, skills and attitudes before and after the workshop. This provided Penn State Extension with information that will be used to improve our curriculum. Three-fourth of the respondents had never before attended a farm food safety workshop, which reflects Extensions' effective outreach to newer grower audiences. On the knowledge based questions, a decrease in correct response rate to the questions on FSMA requirements, safe use of manure based compost, and USDA audit standards indicates a need for the Extension educators and specialists to emphasize these topics. After the workshop, a majority of responding growers indicated that they are confident or very confident about writing a food safety plan and conducting a food safety self-inspection. But many remain uncertain of their ability to do so. Extension programs should increase their focus on enhancing growers' skill and confidence level on preparing for a third party audit as results indicated that only around half of the respondents are confident of doing. After the workshop little more than half of the respondents expressed their willingness to write and update a food safety plan, and only one fifth of the respondents expressed their intention to have a third-party audit done at their farm for the coming growing season. We believe this is a reflection of the degree to which their buyers are mandating GAP compliance efforts. Although the extent to which growers move forward with GAP implementation is strongly influenced by current buyer mandates and future FDA regulations, food safety Extension workshops need to increase the number of respondents who will be willing to write or update a food safety plan, and become successful in passing a third party audit at their farm. Amish and Mennonite growers are a unique group sub-set who rely heavily on sales through local, specialized wholesale marketing channels, such as produce auctions, cooperatives, and small-scale distributors. This group presents challenges to educators who must take into account cultural attributes when developing training materials. Also, their reliance on traditional methods of farming, such as the use of animals in fields, poses new food safety risks which must be addressed in further trainings. Table 1. Correct and incorrect responses to questions before and after 2012 GAP workshops.

Before workshop			After workshop	
Correct Answers	Incorrect Answers		Correct Answers	Incorrect Answers
116 69.0%	52 31.0%	**USDA standards require that pond water used for irrigation be tested for microbes at least 3 times during the growing season (True) (*n*=168)**	155 92.3%	13 7.7%
75 44.6%	93 55.4%	**After hand washing, hands should be dried thoroughly with a clean cloth towel (False) (*n*=168)**	107 63.7%	61 36.3%
119 70.8%	49 29.2%	**The FDA Food Safety Modernization Act recently passed by Congress requires all produce growers to submit to a farm audit (False) (*n*=168)**	99 58.9%	69 41.1%
139 82.7%	29 17.3%	**Produce harvested into boxes or bins should be covered when they are transported to a packing house (True) (*n*=168)**	154 91.7%	14 8.3%
110 65.5%	58 34.5%	**It is possible for manure-based compost to be safely applied around produce crops (True) (*n*=168)**	88 52.4%	80 47.6%
157 93.5%	11 6.5%	**Drip irrigation methods are more likely to cause crop contamination than overhead spraying (False) (*n*=168)**	166 98.8%	1 0.6%
123 73.2%	45 26.8%	**USDA audit standards require produce growers to prove that wild animals are not able to enter fields (False) (*n*=168)**	111 66.1%	57 33.9%
81 48.2%	87 51.8%	**Fresh fruits and vegetables are responsible for the greatest number of foodborne illnesses (True) (*n*=168)**	162 96.4%	6 3.6%
103 61.3%	65 38.7%	**Hand sanitizer sprays are an acceptable substitute for hand washing (False) (*n*=168)**	162 96.4%	6 3.6%
77 45.8%	91 54.2%	**USDA audit standards require packing areas to be fully enclosed (False) (*n*=168)**	138 82.1%	30 17.9%

Table 2. Level of confidence in ability to write a food safety plan, conduct a food safety inspection, or prepare for a third party audit.

Before workshop						After workshop				
Not At All Confident				Very Confident		Not At All Confident				Very Confident
1	2	3	4	5		1	2	3	4	5
26 15.4%	45 26.6%	65 38.5 %	17 10.1%	16 9.5%	**Write a food safety plan**	2 1.2%	9 5.3%	49 29.0 %	72 42.6 %	37 21.9%
13 7.7%	32 18.9%	61 36.1 %	38 22.5%	25 14.8%	**Conduct a food safety inspection**	2 1.2%	5 3.0%	39 23.1 %	76 45.0 %	47 27.8%
41 24.3%	43 25.4%	52 30.8 %	20 11.8%	13 7.7%	**Prepare for a third-party audit**	5 3.0%	15 8.9%	58 34.3 %	63 37.3 %	28 16.6%

Table 3. Intent to write a food safety plan, conduct a GAP self inspection, or submit to a third party audit.

For the 2012 growing season, will you	Yes	No	Unsure
Write or update a food safety plan?(*n* = 194)	101 52.1%	15 7.7%	78 40.2%
Conduct your own food safety inspection? (*n* = 197)	127 64.5%	13 6.6%	57 28.9%
Have a third-party audit done on your farm? (*n* = 190)	40 21.1%	60 31.6%	90 47.4%

Figure 1
Percentage of Participants Confident in Writing a Food Safety Plan

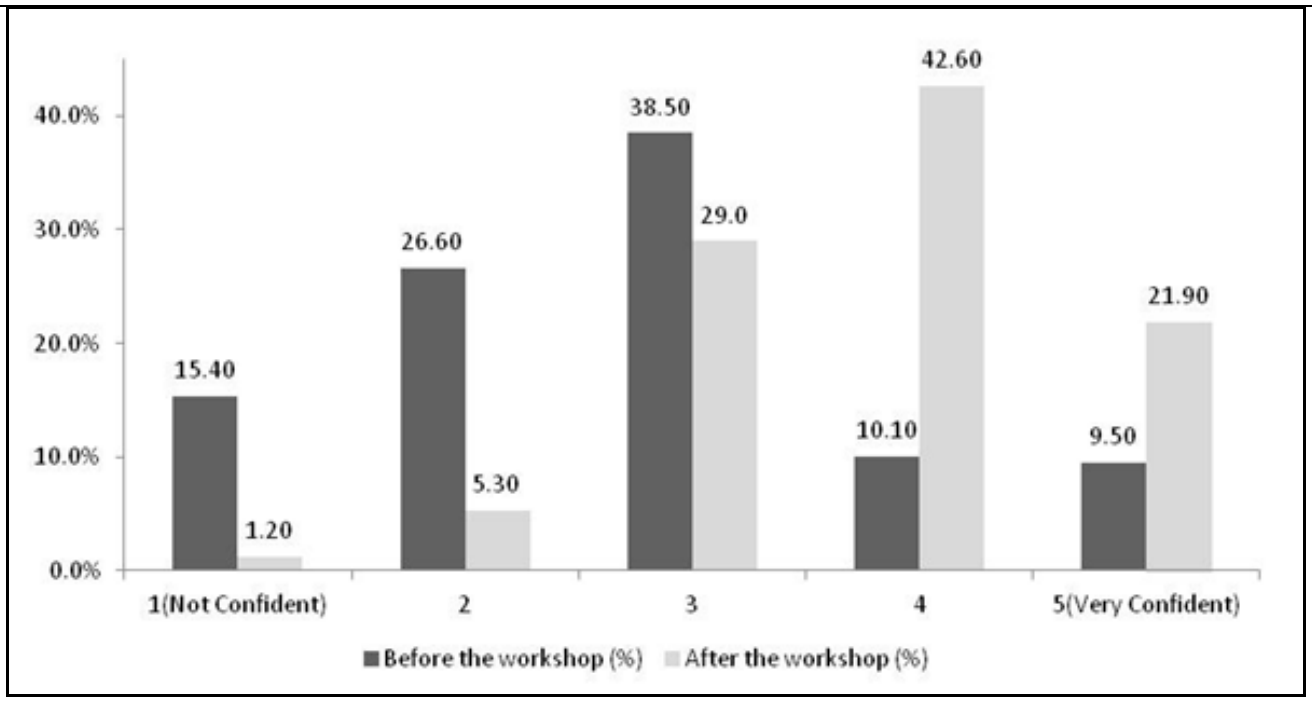


Figure 2
Percentage of Participants Confident in Conducting a Food Safety Inspection

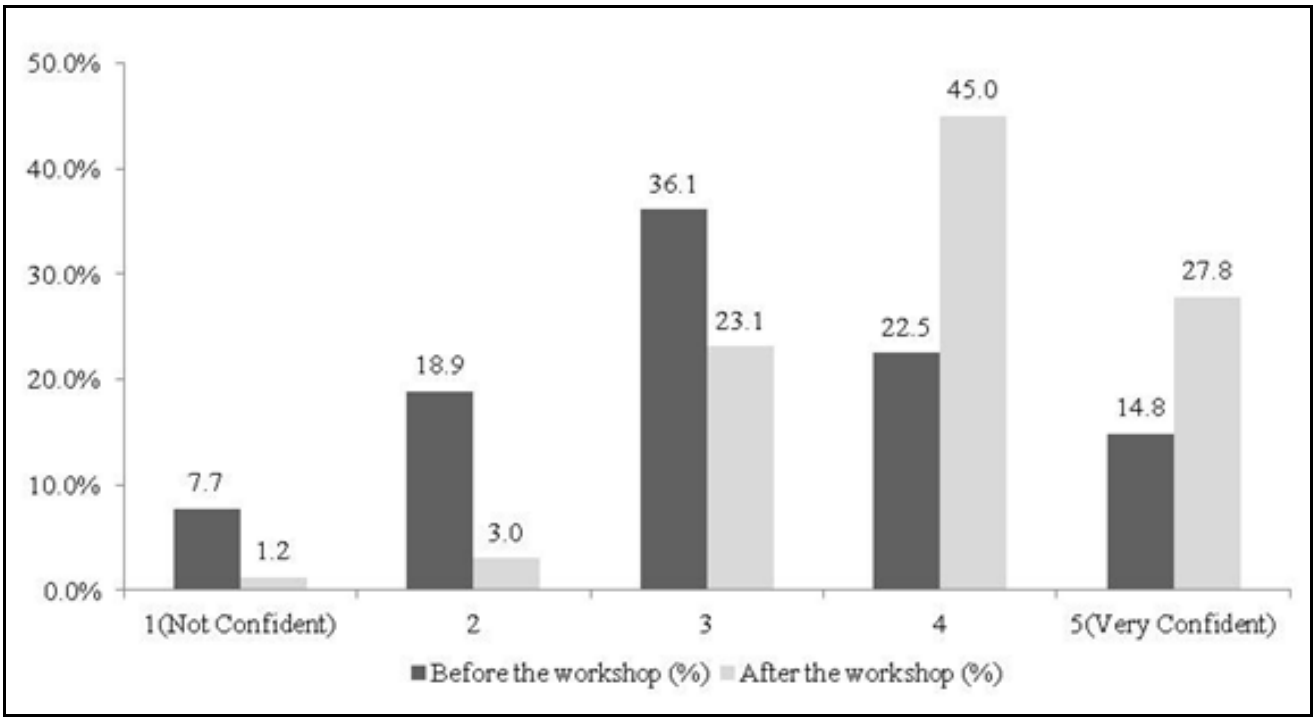
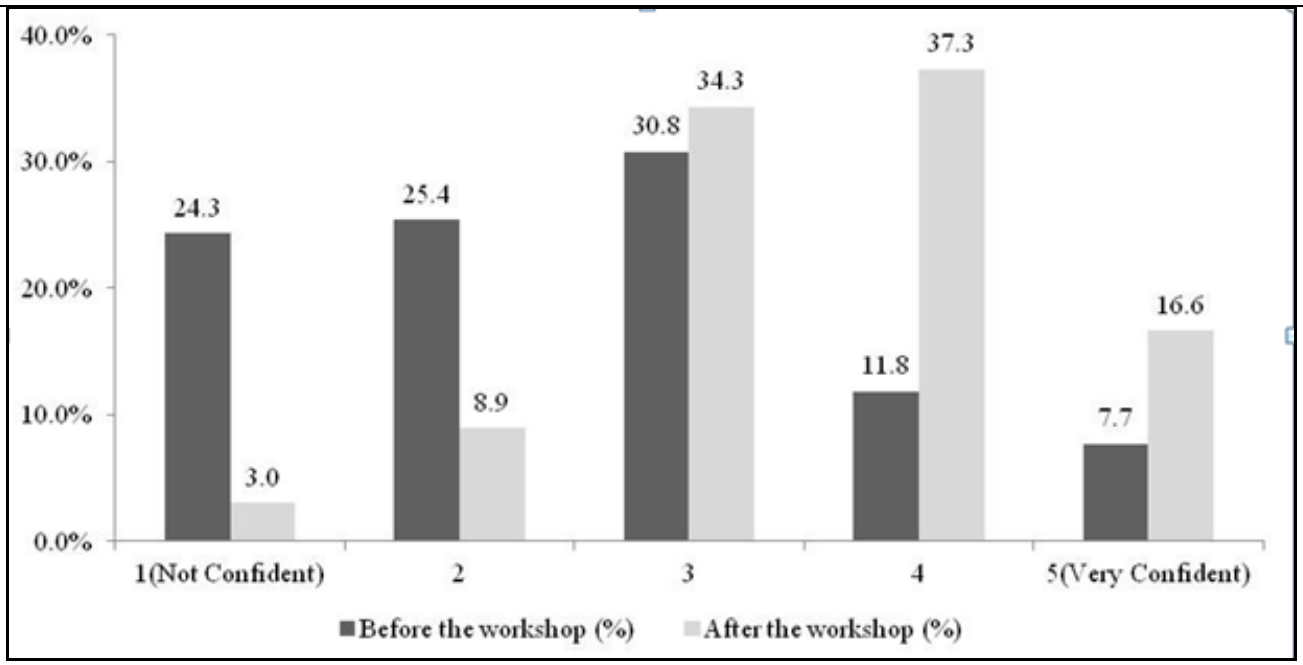


Figure 3
Percentage of Participants Confident in Preparing for a Third-Party Audit



Project Title:	**PA Produce Consumer Awareness Promotion, Project 10**
Project Summary:	Most fresh vegetables are available year-round in Pennsylvania supermarkets. The result is that many Pennsylvania consumers, especially those with no familiarly with agricultural seasons, are not aware when local produce crops are in season and thus fail to take full advantage of the availability of local Pennsylvania produce in their supermarkets, farmers' markets or roadside farm markets. Thus it would beneficial to Pennsylvania produce growers to make the public more aware of when local produce is in season and to highlight the peak season of local produce during the month of August. One effective method of attaining interest in particular crops is to offer new and different recipes for the crop – but a source of these recipes is needed to accomplish this. The Vegetable Marketing and Research Program has worked for many years to promote Pennsylvania produce by celebrating August as Pennsylvania Produce Month, by issuing various press releases during the vegetable season, and by sponsoring an annual vegetable recipe contest. However, the Program has always been very limited in its budget and thus its efforts have been limited in their effectiveness. This SCBG project enabled the Program to be more effective in these promotion activities.
Project Approach:	The first component of the project was to conduct a season-long press relations effort by producing press releases for the media in the state, especially the print media. The press releases focused on the major Pennsylvania produce crops during their respective seasons and featured recipes for the crop. Each year the corn release is sent by first class mail in a clear plastic envelope with a corn picture in color – hopefully attracting the attention of editors. The rest were emailed to the Program's list of papers who have requested electronic copies in the past. In 2011, they were also distributed by the clipping service's distribution system which was included as part of the clipping service for the first time. The second component of the project was to continue the Program's annual Pennsylvania "Simply Delicious, Simply Nutritious" Vegetable Recipe Contest to generate new and creative recipes for Pennsylvania vegetable crops that can be used in the press releases as well as on recipe cards and on the Program's website, www.paveggies.org. The contest was announced with a press release mailed to newspapers across the state and by a mailing to previous recipe contest participants. Brochures about the contest were distributed to larger

	farm markets across the state as well. Sixteen recipes were chosen by a panel of four food-professional judges for the final Cook-Off held at Harrisburg Area Community College on the first Friday in August in conjunction with Pennsylvania Produce Month. Finalist recipes were chosen on the basis of creatively, healthfulness/nutrition, ease of preparation and overall appeal. The finalist contestants prepared their entries for the judges who tasted and scored each recipe to determine the first-place winner in each category First-place winners received a $100 prize and the other finalists received $25 gift certificates to the farm market of their choice. The finalist recipes were posted on the Program's website and press release with the results issued. Recipes from the contest are used in the Program's press releases and on the recipe cards. A two-year rotation for the contest categories is used to cover the various Pennsylvania vegetable crops regularly: Tomatoes/Peppers/Eggplant — Snap Beans/Lima Beans/Peas Melons/Cucumbers — Sweet Corn Summer Squash/Zucchini — Broccoli/Cabbage/Cauliflower Winter Squash/Pumpkins — Beets/Carrots/Turnips OR Leafy Greens The third component of the project was promoting August as Pennsylvania Produce Month. Proclamations or resolutions designating August as Pennsylvania Produce Month were requested from the Governor, state Senate and State House of Representatives. [Note: A minimal amount of personnel time was spent for these email and phone requests. All personnel costs are covered by the Program as an in-kind contribution to the project.] The Program offered its growers Pennsylvania Produce Month point-of-purchase kits which consisted of two large posters and 20 price cards. In addition, six small posters were sent to all growers who ordered general point-of-purchase materials from the Program regardless of whether they ordered the Produce Month kit to hopefully encourage them to participate in the promotion to some degree. All the Produce Month materials feature similar designs with the "Simply Delicious" logo. Additional Produce Month kits were shipped to the produce auctions across the state to sell to markets who purchase local produce at the auctions. The Program also offered Pennsylvania Produce Month point-of-purchase materials – large posters, small posters and/or price cards – to supermarkets across the state. A press release highlighting the availability of local vegetables was distributed. The project funding also enabled the Program to do paid advertising on the Radio Pennsylvania Network news broadcasts and the Total Traffic reports in late July and August. These ads encouraged consumers to visit their local farm market, community farmers' market or supermarket for fresh Pennsylvania vegetables – the traffic report ads urged drivers to stop on their way home to pick up some vegetables. They also touted the vegetable recipes on the Program's website at www.paveggies.org.
Goals and Outcomes Achieved:	The following are the results from the clipping service for the general press relations portion of the project. Press releases were issued on the crops or topics listed in the first column on the table. The number of articles printed according to the clipping service is listed in the third column with the circulation for those newspapers or online posts totaled in the fourth column. These results are compared to the results in 2011 and 2008. Press releases were issued in 2010 and 2009, but a clipping service was not retained to document the effectiveness of the press relations efforts because of budget constraints. Please note: circulation is listed by the 1,000's

Crop	2012 Date	2012 Articles	2012 Cir.	2011 Date	2011 Articles	2011 Cir.	2008 Date	2008 Articles	2008 Cir.
Sweet Corn	29-Jun	22	1,667	2-Jul	12	360	3-Jul	2	605
Tomatoes	14-Aug	8	157	14-Aug	3	81	7-Aug	1	285
Snap Beans		4	53	24-Aug	5	104	7-Aug	2	24
Melons/Cantaloupe	27-Aug	6	214	14-Aug	1	12	7-Aug	2	36
Zucchini	14-Aug	5	104	14-Aug	2	83	7-Aug	5	46
Cucumbers	27-Aug	3	98	14-Aug	1	71	7-Aug	2	21
Peppers	27-Aug	3	30						
Pumpkins/Squash	29-Sep	8	709	9-Oct	4	29	9-Oct	14	1,566
Cole Crops	29-Sep	7	146	9-Oct	3	35	16-Oct	6	218
Beets/Root Crops				24-Aug	3	87		1	104
Lima Beans				24-Aug	5	93			
Flood Damage				15-Sep	5	2,614			
Tomato Salmonella							16-Jun	10	170
Carbon Footprint							5-Sep	4	69
Multiple/Other		4	433					2	21
Totals		70	3,610		44	3,569		51	3,165

As can be seen from the table, most of the coverage (in terms of circulation) for 2011 came from the press release issued after the flooding that followed Tropical Storm Lee in September which was picked by the Pittsburgh Post-Gazette and published on their online edition. In 2011, several of the other articles and circulation counts were favorably increased by coverage in the Harrisburg Patriot which combined recipes from several of the individual crop releases into one article with a prominent section for each crop. In 2012, much of the coverage, in terms of circulation and number of articles) was from the very successful sweet corn release. Again, coverage by the Pittsburgh Post-Gazette, the Harrisburg Patriot (print and online), the Lancaster Intelligencer-Journal and the Penn Live online boasted the circulation counts for the corn press release.
The goal was to achieve placement of 67 articles in newspapers reaching 2.15 million readers each year of the project – an increase of 5% over the five-year average for 2004 to 2008, the last five year period for which data was available. The goal of 67 articles was not reached in 2011 but surpassed in 2012. The readership goal was easily surpassed both years.

Following are the statistics from the recipe contests over the past nine years the Program has conducted it.

Contest Statistics	2012	2011	2010	2009	2008	2007	2006	2005	2004
Recipes Entered	82	66	110	106	122	94	83	100	106
Contestants	40	30	43	41	46	21	27	27	
Press Articles	37	22	NA	NA	46	21	43	57	38
Circulation (1,000s)	1,672	3,413	NA	NA	3,122	656	1,130	1,571	1,006

Although the number of recipe entries and contestants was down from previous years, the contest did succeed in producing quality recipes that were carried by numerous newspapers across the state. For 2012, over 100 recipes were submitted but one contestant submitted about 20 recipes that were found to have been copied from various online sources. That contestant's entries were thus disqualified as the contest rules requires the contestant or a family member to have created or modified the recipe. The original goal was to increase participation 5% each year, which would have meant 116 recipe entries in 2011 from 45 contestants and 122 recipe entries in 2012 from 48 contestants. This goal was not met.

In 2011, over 20 articles were printed about the contest after the clipping service was retained in July, including articles in the Pittsburgh Post-Gazette. Thus the clipping service did not pick up any articles announcing the contest prior to the recipe submission deadline of June 30. The 22 articles announcing the Cook-Off or the Cook-Off results reached 3.4 million potential readers. In 2012, most of the 37 articles reported by the clipping service, which was retained beginning May 11, were prior to the contest deadline. Only 8 articles reaching about 465,000 readers were printed reporting the results. The major outlets reporting the results were the Pittsburgh Post-Gazette (print and online) and Lancaster Farming. The goal was to secure placement of 67 articles in newspapers reaching 2.15 million readers, a 5% increase over 2008. This goal was not met either, except that the readership goal was surpassed in 2011.

The Program conducts a survey of the judges and the contestants after each year's Cook-Off. The comments from these surveys are used to make improvements to how the contest and Cook-Off are conducted, but both the contest and the Cook-Off consistently receive favorable reviews from both groups. One judge, who served in the contest for the first time in 2011, although she has judged many cooking/recipe contests at county fairs and other similar events, commented "This is the most organized recipe contest that I have ever worked with! I would not change anything!" We consider this a real compliment.

The bottom line goal for the recipe contest is to provide creative, tasty, practical recipes the Program can freely use in its press relations, on its website and on recipe cards. The contest always succeeds in meeting that goal. We feel fortunate that the Pittsburgh Post-Gazette especially has regularly considered the winning recipes from the contest worthy of publishing in their print and online editions.

In 2011, the Program had 91 growers order 130 Pennsylvania Produce Month point-of-purchase kits. In 2012, 77 growers ordered 124 kits. The six small Produce Month posters were sent to about 350 growers in 2011 and about 420 in 2012. Seven to 10 markets each year ordered a compact disc with graphics that growers could use in their print advertising. This compared to 176 participating markets in 2006, 202 in 2007, 100 in 2008, 125 in 2009 and 97 in 2010. The goal was to increase participation by 5% per year, which has not happened as determined by the orders for kits. However an unknown number of markets are participating by purchasing the Produce Month point-of-purchase kits at the produce auctions. A total of 280 kits were shipped to produce auctions in 2011 and 340 were shipped in 2012, although not all of these kits were necessarily sold.
In 2011, 251 supermarkets received Produce Month materials and 237 in 2012 as detailed below.

Acme Markets
- 2011 – 50 stores (50 large posters, 50 small posters and 50 packs of price cards)
- 2012 – unable to make contact

Associated Wholesalers
- 2011– 25 stores (25 large posters, 25 small posters and 25 packs of price cards)
- 2012 – 60 stores (60 large posters, 60 small posters)

Family-Owned Stores
- 2011 – 15 stores (15 large posters, 90 small posters and 15 packs of price cards)
- 2012 – 15 stores (30 large posters, 150 small posters)

Karns Quality Foods
- 2011 – 7 stores (20 large posters and 40 small posters)
- 2012 – 7 stores (20 large posters and 7 packs of price cards)

Redner's Warehouse Markets – 35 stores (15 large posters, 90 small posters and 15 packs of price cards)

SuperValu
- 2011– 120 stores (120 large posters, 200 small posters and 50 rolls of bin wrap)
- 2012 – 120 stores (200 large posters)

Previous year's participation was 2010 – 272 markets; 2009 – 404; 2008 – 546; 2007 – 543. Here again, the goal of increasing supermarket participation by 5% per year was not met. Over the years some of the largest chains have declined to participate because they have developed their own branded promotions for local produce – so they are promoting local produce but not with the Program's materials. One of the chains has a company policy against using third-party signage in their stores. The Program feels it is still worthwhile to offer the materials to those stores who are willing to participate.

In 2011, Secretary of Agriculture George Greig presented the Governor's Produce Month proclamation to Program Executive Secretary William Troxell at Vegetable Recipe Contest on August 5 at Harrisburg Area Community College where he also presented the first place awards. In 2012, the Secretary presented the Governor's proclamation at a press event organized by the Department at the Scranton's Farmer's Market. The growers in the market, as well as other area growers, provided a donation of fresh and canned produce for the local food bank in Scranton. This generated considerable press coverage, so that many more articles were published in both print and online outlets, greatly increasing the coverage as outlined below. While the goal of 33 articles each year was not met, the goal of reaching at least 1.41 million readers was greatly exceeded in 2012.

2012	2012		2011	2011		2008	2008
Articles	Cir. (1,000s)		Articles	Cir. (1,000s)		Articles	Cir. (1,000s)
24	8,292		14	384		35	1,618

In 2011, the Program contracted with Metro Traffic to sponsor traffic reports 30 times per week in the Allentown/Bethlehem, Altoona, Erie markets the week of August 1 and 45 times per week in the Harrisburg/Lebanon/Carlisle, Lancaster/York, Pittsburgh, and Wilkes-Barre/Scranton markets. A similar schedule was repeated the week of August 22 in all but the Altoona and Erie markets. The total cost for these sponsorships was $12,150. The advertisements resulted in 3,104,200 gross impressions with a reach of 1,252,060 or 26.5% of adults 18 and older. During the first week, 316 additional bonus spots were run worth $6,983 and additional bonus spots the second week was valued at $4,563. The Program also contacted with Radio Pennsylvania to run ten 30-second spots on their news network plus KYW in Philadelphia the week of August 1 at a cost of $8,000. Ten bonus spots were also run.

In 2012, the Program ran 40 spots (22 paid, 18 bonus) on the Radio Pennsylvania network and KYW in Philadelphia between July 30 and August 11. This resulted in 1.032 million gross impressions at a cost of $10,000. A two week schedule of traffic report sponsorships with the Total Traffic network was run in the Allentown/Bethlehem, Altoona, Erie, Harrisburg/Lebanon/Carlisle, Lancaster/York, Pittsburgh, and Wilkes-Barre/Scranton markets with 25 to 40 sponsorships per week. A total of 674 spots were aired at a cost of $11,360. Final reports on the number of gross impressions have not yet been received.

The deciding factors in choosing the networks to work with were geographically covering most of the state (Radio Pennsylvania) and strategically concentrating coverage in the major population centers (traffic networks). While the Program sought to get the greatest amount of coverage for the budget available, current costs and availability ultimately determined the extent of the radio advertising campaign. Radio was determined to be much more cost effective than outdoor advertising (billboards) which the Program considered and has used in the past.

The Program carries on several other marketing/promotion activities besides those covered in this project. The Program's distribution of general point-of-purchase materials (i.e. materials not tied to the Produce Month promotion) and maintenance of the www.paveggies.org website are being conducted with support from another Specialty Crop Block Grant. They are all ultimately designed to help increase the fresh market sales of

the growers in the state. We do not feel it is feasible for us to attempt to measure actual sales data because of the reluctance of growers to submit exact dollar sales and the impossibility of getting data from all the growers. We have, however, in the fall of 2010 and 2011, asked our growers to give us their best estimate as to whether their fresh market sales of vegetables, relative to the previous year, have: decreased, remained about the same, increased 1 to 5% or increased 5% or more. We have also asked them to indicate if they made major changes to their operations in the past year that would have significantly increased their sales (changes like construction of new market facilities, attending a new or additional farmers' market, starting a CSA, etc.). In 2011, many parts of the state experienced flooding or at least excessive rainfall that caused major losses for growers. Therefore, in 2011 we asked them to also estimate whether their sales would have increased or decreased if the weather during September 2011 had been "normal". In 2012, we asked those who were negatively affected by the 2011 weather to compare their 2012 sales to both 2011 and 2010 sales. The results of these survey questions from just over 200 responses each year are presented below:

Compared to the previous year, has your sales volume

	2012	2011	2010
- decreased	21%	39%	21%
- remained about the same	38%	30%	37%
- increased 1 to 5%	19%	20%	23%
- increased 5% or more	21%	11%	14%

Did you make major improvements or changes to your operation that you believe significantly increased your sales (built new market facilities, attended an additional farmers market, started a CSA, etc.)

	2012	2011	2010
- yes	20%	12%	12%

Did the flooding and wet weather in September 2011 significantly decrease your sales/yields for 2011?

- yes	51%	68%

If September 2011 had been a "normal" September, do you project your sales volume for 2011 (compared to 2010) would have:

	2011	2010
- decreased	10%	21%
- remained about the same	39%	37%
- increased 1 to 5%	32%	23%
- increased 5% or more	19%	14%

If your sales were negatively impacted by the flooding in September 2011, how would your 2012 sales compare to 2010?

	2012	2010
- decreased	29%	21%
- remained about the same	29%	37%
- increased 1 to 5%	21%	23%
- increased 5% or more	20%	14%

This type of survey cannot give solid data. Moreover, besides the Program's promotion efforts involved in this project and the Program's other promotion efforts, there are numerous other factors that influence a grower's sales. Most important, of course, is the grower's own individual efforts and skills in promotion, merchandising,

	management, and production. The national "buy local" consumer trend also plays a major role in the success of local growers' sales. Still, the survey data does show that more growers are estimating increased sales over the past two years had the weather been "normal". So while the Program cannot claim sole credit for this apparent growth in sales of local produce, hopefully the Program's promotion efforts, including those funded by this grant project, and have helped contribute to that apparent growth.
Beneficiaries:	Making Pennsylvania consumers aware of when and where fresh local produce is available and how to prepare it is the focus of all three components of the project. Hopefully that encouraged them to not only buy local Pennsylvania vegetables, but actually eat more vegetables to the benefit of their health in the long term. The press relations effort for the crops in general as well as the recipe contest and Pennsylvania Produce Month plus the radio advertising campaign for Produce Month potentially reached literally millions of consumers. Since there would be considerable overlap between the outreach of these three components, it is impossible to put an accurate figure on the total number of people impacted. The Program's stakeholders are the commercial vegetable growers of Pennsylvania, specifically the 1,700 on the Program's grower list. The Program's reason for existence, as stated in its mission statement, is to fund practical vegetable research and to promote Pennsylvania vegetables. The activities of this project are some of means by which the Program is seeking to promote Pennsylvania vegetables. By doing so, the Program hopes to help its growers successfully and profitably market their crops.
Lessons Learned:	For the press relations component of the main need for improvement is to compile and distribute the crop press releases earlier in the season. They are often used by the papers three to four weeks after being distributed and thus are not as timely as they could be. The press releases contained background information on the individual crops as well as the recipes so that they can be used as a feature article or simply for the recipes. Papers used them both ways. Consideration has been given to developing feature-type articles based on a Pennsylvania grower in an effort to garner greater interest from editors. The writing skills of the Program staff and the fact that editors usually prefer such articles featuring growers in their circulation area are factors that may have limited the effectiveness of this approach. A survey of editors might provide some tips in creating a greater rate of use of the Program's releases. The recipe contest has been running very smoothly. While it would have been nice to have greater participation, the contest was successful in generating tasty, creative recipes. We annually survey the judges and the contestants for suggestions. The judges this year suggested we add a fifth criteria for choosing the finalist recipes – use of the category vegetable. Creativity, healthfulness/nutrition, ease of preparation and overall appeal have been the criteria used so far, but the judges felt that in some cases recipes were chosen for a category even though they had only a small amount of that vegetable in the recipe. This fifth category would give a higher score to recipes that showcase the category vegetable better. Contestants have suggested that the categories be changed to something like appetitizers, main dishes, side dishes, desserts, etc. Originally the contest did have these categories but the result was that only a small number of different vegetable crops were featured in the recipes. Using the crops as a category forces the contestants to enter recipes that feature some of the minor crops, which better fulfills the Program's purpose in sponsoring the contest. Admittedly, comparing a carrot side dish to a carrot cake can be a difficult choice for the judges. In an effort to encourage a greater rate of repeat participation by current contestants, the Program sent each person who entered a recipe in the contest a report on the outcome of the Cook-Off. This report included complimentary copies of all the finalists recipes. It was recognized that in the past unsuccessful contestants had no communication from the Program regarding the results of the contest and thus may have been discouraged from submitting entries in a future year. A similar report was also sent to contestants in previous years' contests as well, again with the goal of encouraging them to consider entering recipes in future contests.

	One of the biggest successes of the Pennsylvania Produce Month this year was the press event organized by the state Department of Agriculture. Most of the coverage was centered around the donation of produce to the local food bank rather than Pennsylvania Produce Month directly, but the coverage did include Produce Month and the Scranton Farmers' Market were the event was held. The time and experience of the Department's press office in organizing this event, as well as their contacts with the media as a government agency, greatly increased the media coverage of the event. While the in-person coverage of the event by the press was light, the press release was picked up by numerous outlets. The Program is at the mercy of the Department as to whether this type of cooperation for a press event can be obtained in the future. To encourage greater Produce Month participation by growers, the last two years the Program has included six small Produce Month posters with each of the Program's point-of-purchase orders (350 in 2011 and 420 in 2012) even if they did not order the Produce Month kit. It is unknown how many used these posters. The Program's 2012 annual grower survey found that 45 (23%) of the 194 growers responding to the survey question indicated their market participated in the Produce Month promotion. Using the response to another question regarding the number of growers who ordered regular point-of-purchase materials, it is estimated that about four times as many growers (or 180) actually did participate in the Produce Month. Only 77 growers ordered the Produce Month kits from the Program directly and many likely purchased kits at the auctions, but some probably just used the six small posters included with the regular point-of-purchase materials. Each year some growers object to the Program promoting August as Pennsylvania Produce Month arguing that they sell vegetables in other months of the season. The Program readily acknowledges that the season is longer than August. The regular point-of-purchase materials and the press relations efforts both are not tied to August. But since August is the peak of the season for most vegetable crops in most of the state, it is the best time for the Program to highlight local vegetables with activities like the paid radio advertising. This year, some of the radio ads actually aired in late July leading up to August.
Contact Person:	Project Coordinator: William Troxell phone 717-694-3596, fax 717-694-3596 pvmrp@embarqmail.com
Additional Information:	Recipe Contest Brochure Front and Back

What
State-wide Vegetable
Recipe Contest

When
Entries Due - June 30, 2012
Cook-off – August 3, 2012
at Harrisburg Area
Community College

Categories
Tomatoes/Peppers/Eggplant
Melons/Cucumbers
Summer Squash
Winter Squash/Pumpkins

Prizes
$100 Prize
for best recipe in each category
$25 Gift Certificates
for other finalists

For further information about the contest, contact the Program at 717-694-3596 or pvrmp@embarqmail.com.

For finalist recipes from previous contests, visit our website at www.paveggies.org.

PA Preferred™
Grown in PA. It makes a difference.

Pennsylvania Vegetable Marketing and Research Program
2301 North Cameron Street
Harrisburg, Pennsylvania 17110-9408
717-694-3596
pvmrp@embarqmail.com
www.paveggies.org

Enter Your Favorite Recipe In the

2012 Pennsylvania "Simply Delicious, Simply Nutritious" Vegetable Recipe Contest

State-wide Contest
Four $100 Prizes!
Entry Deadline June 30

The Pennsylvania Vegetable Marketing and Research Program is sponsoring the ninth annual Pennsylvania "Simply Delicious, Simply Nutritious" Vegetable Recipe Contest this summer. Pennsylvania residents are eligible to enter one or more of their best vegetable recipes using Pennsylvania vegetables to compete for $100 prizes in four different categories at a state-wide cook-off.

A panel of four judges will review the written recipe entries and select sixteen finalist recipes to be prepared by the contestants at the state-wide cook-off. Four recipes will be chosen in each of the following four categories:

Tomatoes/Peppers/Eggplant
Melons/Cucumbers
Summer Squash/Zucchini
Winter Squash/Pumpkins

Recipe entries must contain as a major ingredient at least one of the vegetables in the category title. Fresh, canned, frozen or dried vegetables can be used in the recipe.

Recipes will be chosen on the basis of creativity, nutrition/ healthfulness, ease of preparation, and overall appeal.

Recipes must be created or modified by the contestant or a member of the contestant's family. Recipes previously published in a copyrighted publication will not be eligible.

Contestants may enter any number of recipes in any number of categories. Contestants will, however, be limited to having only one recipe chosed as a finalist recipe in any one category and to having a finalist recipe in only two categories.

The cook-off will be held on August 3 at Harrisburg Area Community College in Harrisburg. A $100 prize will be awarded to the winner in each category. Other finalists will each receive a $25 gift certificate for the farm market of their choice.

Recipes should be formatted or printed in upper and lower case letters in the following manner:
Category
Name of dish
Number of servings
Ingredients list – List in order of use. Spell out units of measure like tablespoon, teaspoon, cup, ounce, pound, etc.
Instructions – List in order in complete sentence form.

Entries must be entered by June 30, 2012, by one of three methods:

emailed to: pvmrp@embarqmail.com (preferred method)

faxed to: 717-694-3596

mailed to:
PA Vegetable Marketing and Research Program
815 Middle Road
Richfield, PA 17086-9205

Hardcopy entries must be typed or printed on a sheet of 8 1/2" x 11" plain white paper. On the back side of the entry, print the contestant's name, mailing address, and telephone number, plus email address or fax number if available. For email entries, put the contact information (name, address, telephone, email) after the recipe.

Entry of a recipe in the contest will authorize the use of the recipe, with credit given to the contestant, by the Pennsylvania Vegetable Marketing and Research Program in the Program's press releases, recipe cards, brochures or other published materials. The Program reserves the right to copyright such publications.

Sweet Corn Press Release (first press release of the season)

Local Corn Is Here Early and Better than Ever

Nancy, Natalie, Abby and Will enjoy some of the first corn of the 2012 season fresh from the field at Triple B Farms in Monongahela, PA, operated by their parents Bill and Sue Beinlich and grandparents Ron and Carolyn Beinlich. Pennsylvania's sweet corn harvest started earlier than ever in most parts of the state and the outlook for this year's crop is very good.

To obtain jpeg files of this photo and others, contact the Pennsylvania Vegetable Marketing and Research Program at 717-694-3596 or pvmrp@embarqmail.com.

AUGUST IS PA PRODUCE MONTH

Editors: Enclosed is the first release of the season from the Pennsylvania Vegetable Marketing and Research Program. This year the Program is again designating August as Pennsylvania Produce Month to focus attention on "Simply Delicious, Simply Nutritious" Pennsylvania grown vegetables during their peak season. We will be electronically distributing a series of press releases with recipes on various Pennsylvania vegetable crops in the next several weeks for your use during July and August. We would very much appreciate your help in highlighting Pennsylvania vegetables this summer, especially during PA Produce Month. To make sure you are on our email distribution list, please contact us at 717-694-3596 or pvmrp@embarqmail.com.

Additional information about Pennsylvania vegetables for you and your readers is always available on our website at www.paveggies.org.

PENNSYLVANIA VEGETABLE MARKETING AND RESEARCH PROGRAM
2301 North Cameron Street, Harrisburg, Pennsylvania 17110-9408
717-694-3596 pvmrp@embarqmail.com www.paveggies.org

FOR IMMEDIATE RELEASE
June 28, 2012

Contact: William Troxell
717-694-3596
pvmrp@embarqmail.com

Local Corn is Here Early - and Better than Ever

FOR AN ELECTRONIC VERSION OF THIS RELEASE, contact us. *Local growers are the best source for local conditions. If you do not have local grower contacts, contact us.*

Growers around the state are reporting some of earliest sweet corn harvests ever – and the crop is looking real good. Chris Powell from Strasburg in Lancaster Co. reported they started picking corn about June 21 while Jim Paulus from Mechanicsburg in Cumberland Co. said they have been picking corn for two weeks now. Both growers indicated they were expecting a good supply of quality corn for the coming weeks. In western Pennsylvania, Ron Beinlich in Monongahela, Washington Co. was harvesting corn by June 22 and Art King in Valencia, Butler Co., started his harvest on June 24, about a week earlier than usual.

The unusually warm weather this spring allowed growers to plant earlier than most years and also pushed the crop along once it was planted. While there were some very wet periods in some parts of the state that may have interfered with planting schedules, the generally favorable weather during June has produced a very promising outlook for this year's sweet corn crop. As a result, consumers can expect abundant supplies of Pennsylvania sweet corn at community farmers' markets, roadside farm markets and supermarkets across the state this summer. Fresh, local sweet corn is the best tasting corn to be had.

Growers start planting corn about the middle of March under a clear plastic mulch. The warm moist environment under the clear plastic mulch is ideal for rapid seed germination and seedling development in cool March and April days. Some growers plants their seeds through black or green plastic mulch and cover it with row covers. Other growers go an extra step and start their corn in the greenhouse and transplant it to the field under clear plastic row covers supported by wire hoops. All these systems represent a greater investment for the grower in terms of time, equipment and supplies but enable the grower to hit the early market. Corn planted on bare ground without mulch or row covers generally matures two to three weeks later.

-- more -

Pennsylvania Sweet Corn page 2

Irrigation is essential to a good corn crop in many years. The critical period for adequate moisture for corn is during silking and ear development. Traditionally corn has been irrigated by overhead sprinklers or large irrigation guns that cover a large area at once. Many sweet corn growers are now turning to trickle irrigation which is the most water-efficient method of irrigation available. With this method of irrigation, a plastic tube with tiny emitters is laid down between every other row of corn. Water and fertilizer are pumped into the tubes and trickles out to the roots of the sweet corn crop.

The key to great-tasting sweet corn is freshness. The sugar in sweet corn rapidly begins turning to starch within hours after being harvested. About 40% of the sugar can be lost in six hours at room temperature. Refrigeration slows this process, but the sooner corn is eaten after harvesting, the better it will be.

Most growers are growing sugar-enhanced or super-sweet varieties that genetically have more sugar in the kernels. Some of these early sugar-enhanced varieties where developed at Penn State University. Because they have more sugar to begin with, they can be stored for longer periods and still have acceptable sweetness. However, standard sweet corn varieties, when purchased freshly harvested, will still have a delicious, traditional corn flavor and sweetness.

According to growers across the state most Pennsylvanians prefer bi-color corn, traditionally known as Butter and Sugar. However, in south central and southeastern Pennsylvania, white is the preferred corn. Certain localities and clienteles still like their corn to be yellow so many growers also grow some yellow varieties.

Sweet corn is one of the leading vegetable crops in the Commonwealth with about 16,000 acres grown annually. About 95% of this sweet corn acreage is grown for fresh market sales. As a result, Pennsylvania ranks as the eighth largest fresh-market sweet corn producing state in the nation. About 1,000 acres of the sweet corn acreage are grown to be processed into frozen or canned corn products available year around. Fresh corn will be available from late June into October.

While fresh sweet corn is a delicious ingredient in many recipes, it is most popular served right on the cob, and is so simple to prepare with these tips from Penn State Cooperative Extension. Simply boil husked ears for four to seven minutes in unsalted water – salt may toughen the kernels. If you prefer grilled corn, remove the silk from the ear but leave the husk on. Soak the ears for 10 minutes in cold water and then grill them for 15-20 minutes. To roast, remove the silk and husk from the ears, brush with melted margarine or butter and wrap in foil. Roast the wrapped ears for 15 to 20 minutes on the grill.

Fresh corn-on-the-cob is also easily prepared in the microwave by wrapping two husked ears in a damp paper towel and cooking them for seven minutes on high power, turning the ears once.

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Pennsylvania Sweet Corn page 3

Many roadside farm markets offer larger quantities of corn for home freezing. Penn State University offers detailed instructions on the web at http://foodsafety.psu.edu/lets_preserve.html, This information is also available at any Penn State Cooperative Extension office or by contacting the Pennsylvania Vegetable Marketing and Research Program at 717-694-3596. Many general cookbooks offer detailed instructions and recipes as well.

The following corn recipes offer other creative methods to enjoy Pennsylvania "Simply Delicious, Simply Nutritious" sweet corn. These recipes were entered in the 2011 Pennsylvania "Simply Delicious, Simply Nutritious" Vegetable Recipe Contest. Additional corn recipes are available at www.paveggies.org.

Colorful Corn Chowder
Serves 4 to 6

1/2 pound bacon, diced
1 cup finely diced onion
1/4 cup coarsely diced red bell pepper
2 cloves garlic, minced
2 cups peeled and coarsely diced potatoes
1 cup coarsely diced carrots
3 cups regular or low sodium chicken broth
4 cups sweet corn, reserving 1/4 cup for topping
3 cups milk
3 tablespoons butter
fresh pepper, to taste
salt - optional

In a medium skillet fry the diced bacon until crisp. Remove the bacon to paper towels and crumble when cool. Remove all of the bacon drippings except for 2 tablespoons. In the 2 tablespoons of bacon drippings, add the onion, red bell pepper and garlic. Cook 3 minutes over medium heat stirring continuously. Place this mixture in a large pot. Add potatoes, carrots, chicken broth and corn. Cook 10 minutes over medium-high heat or until the vegetables are tender. Add the milk and butter. Season with pepper and salt if desired. Reheat until hot. Serve in bowls and top with the crumbled bacon and reserved corn kernels.
First Place Prize in the Sweet Corn Category

Submitted by Kenneth Ward, Hulmeville

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Pennsylvania Sweet Corn page 4

Fresh Succotash Salad
Serves 5 to 6

3 tablespoons olive oil
1 1/2 tablespoons fresh lemon juice
1 tablespoon honey
1/2 cup minced red onion
1/2 pound fresh green beans, trimmed and cut in half
2 ears of fresh corn, removed from cob
1/2 cup fresh lima beans
2 tablespoon fresh chopped basil
salt and pepper to season

Stir oil, lemon juice, honey, red onion, and salt and pepper to taste together in small bowl. Bring 2 1/2 quarts water to boil in large saucepan. Add 1 teaspoon salt and green beans and cook for 1 minute. Add corn and lima beans and cook until tender, about 5 minutes. Drain vegetables into colander and rinse under cold running water until cool. Drain vegetables well and transfer to serving bowl. Toss vegetables with dressing to coat evenly. Stir in basil and season with salt and pepper. Serve. This salad can be refrigerated for up to 1 day. If making the salad in advance, add the basil just before serving.

Submitted by Kathy Rohrbaugh, Shrewsbury

Curried Corn Chowder
Serves 8

1 tablespoon extra light olive oil
1 medium onion, chopped
1 rib celery, chopped
1 large clove garlic, chopped
2 cans (14 1/2 oz. each) low fat, low sodium chicken broth
1 cup chunky mild salsa
2 cups fresh or frozen whole kernel corn
1/4 teaspoon ground cumin
1 1/4 teaspoons curry powder, or to taste
1 cup finely crushed baked tortilla chips (measured after crushed)
15 or 16-oz. can cream-style corn
salt and pepper to taste
fat free sour cream for garnish, or low fat plain Greek yogurt

Heat oil in saucepan. Add onion, celery and garlic; sauté until onion is translucent. Stir in broth, salsa, whole kernel corn, cumin, curry powder and tortilla chips. Bring to a boil; cover and simmer 5 minutes. Stir in cream-style corn, salt and pepper. Heat briefly. Garnish each serving with a dollop of sour cream,

Submitted by Francis Dietz, York

-- more --

Kay's Corn Fritters
Serves 4

6 ears of sweet corn
2 eggs
3 tablespoons flour
1 tablespoon sugar
1/2 teaspoon baking powder
1/4 teaspoon salt
2 tablespoons butter

Grate ears of corn into bowl, scraping milk from ears with knife. Separate 2 eggs into yolks and whites. Beat whites until stiff. Add egg yolks to corn in bowl along with flour, sugar, baking powder and salt. Stir corn mixture until combined. Fold beaten egg whites into corn mixture until lightly combined. Melt butter in medium non-stick frying pan or seasoned cast iron skillet over medium high heat. Add spoonfuls of fritter batter to frying pan to make approximately 3-inch fritters. Brown on one side, then turn to brown second side. Place on serving plate and sprinkle with sugar. Serve hot and ENJOY!

Submitted by Susan Rothenberger, Boyertown.

Quick buying tips for Pennsylvania Sweet Corn

The Pennsylvania Vegetable Marketing and Research Program offers these tips when buying sweet corn:

-- Look for fresh green husks and ears that are filled all the way to the tip.

-- Kernels should be tender, full and firm enough to puncture easily under the slightest pressure.

-- To preserve the corn's sugar content and flavor, refrigerate immediately after purchase.

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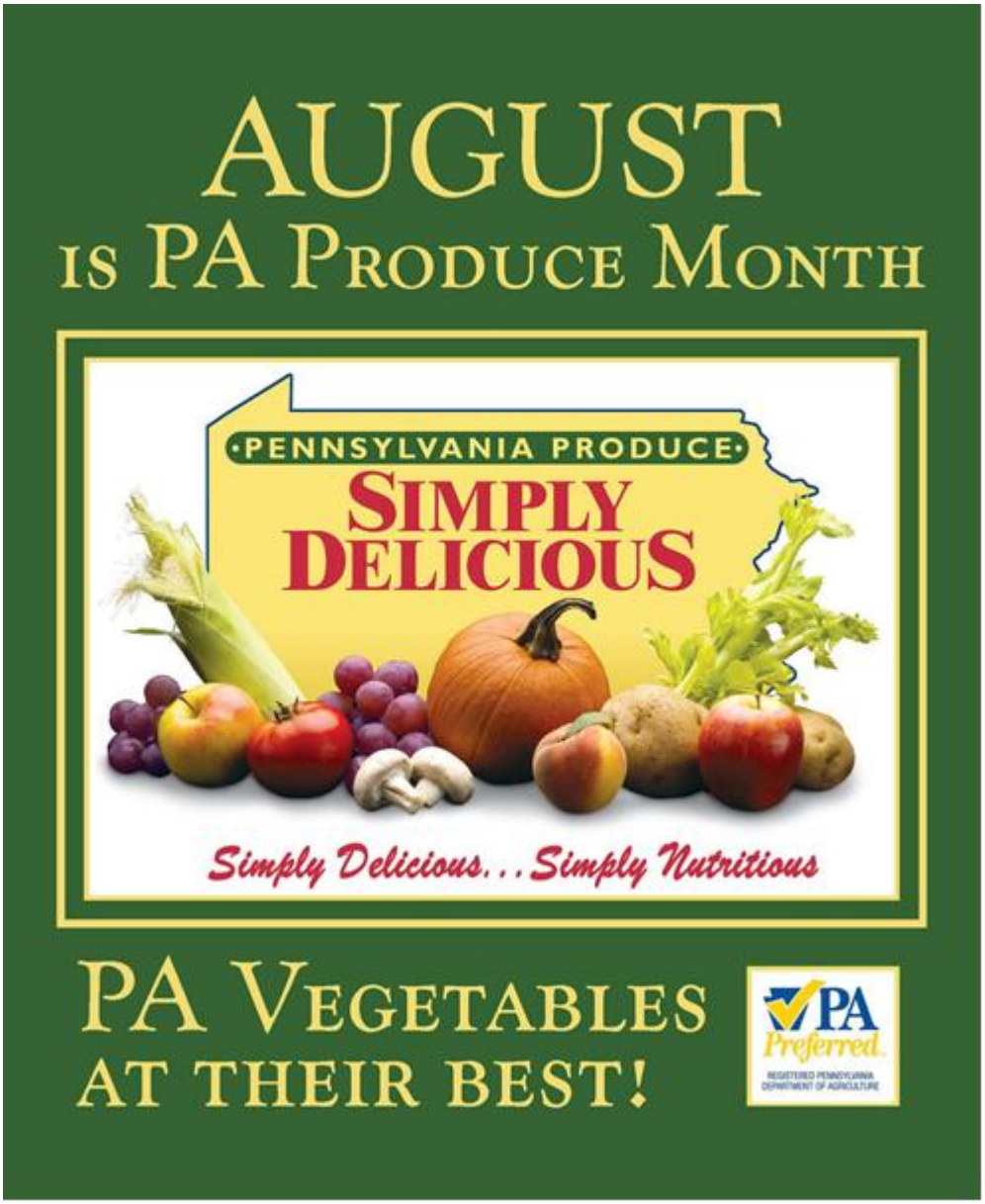
Note: Pictures of sweet corn in the field and of the Colorful Corn Chowder recipe are available upon request at pvmrp@embarqmail.com.

Design of large Produce Month Poster



Text of Traffic Report Sponsorship Ad During August:

August is PA Produce Month and PA Vegetables are at their best right now. Why not stop tonight at a nearby farmers market, roadside market or supermarket to pick up some fresh locally grown sweet corn, tomatoes, peppers, or cantaloupes? For tasty veggie recipes, visit www.paveggies.org.

Project Title:	**Implementing Integrated Pest Management Control Strategies for Invasive Armored Scale Pests of the Christmas Trees, Project 11**
Project	This project was developed because Pennsylvania's conifer growers have been dealing with a major pest issue

Summary:	for years and some growers have expressed interest in finding an alternative method of control. The pest in focus is an armored scale pest of several species of conifers, the Cryptomeria scale (Aspidiotus cryptomeriae), and it is a problem on many tree farms in the Capital area region. The commonly accepted method of controlling this pest is to make multiple applications throughout the growing season of a traditional, broad-spectrum pesticide, but these growers were looking to finding alternative, less chemically-intense control methods. Project leaders began to research alternative options. Cut Christmas trees and landscape conifers are important specialty crops in Pennsylvania and in the country. Pennsylvania ranked fourth in the nation for sales of Christmas and evergreen trees in a 2007 USDA/NASS survey. As a state ranked so highly in the nation, Pennsylvania should also be a leader in innovative growing techniques. By running this project, program staff was able provide research and education to Pennsylvania Christmas tree growers about the use of beneficial insects and soft (or reduced-risk) pesticides for insect control in conifer plantations. While commonly used in ornamental greenhouse operations, these techniques have not been used widely (if at all) in Pennsylvania conifer nurseries and Christmas tree farms. In a national survey of conifer growers, the top three insecticides used were organophosphate and carbamate chemical products, all of which are broad-spectrum products and would be incompatible with most biocontrols. In another survey of chemical usage in the nursery and floriculture industry, only 14 percent of all ornamental growers in Pennsylvania claim to utilize beneficial organisms in their operations. By conducting a grant funded research project involving the incorporation of introduced and native beneficial insects, as well as, soft pesticide products, this project could be shared with other growers to encourage more widespread use of these techniques. Ultimately, the hope was that the use of traditional, broad-spectrum pesticides would be reduced. After working on this project for two growing seasons, the project team has seen success with the process of teaching scouting techniques, monitoring growing degree days, utilizing soft pesticides, and incorporating biological controls. There has also been a reduction of broad-spectrum, traditional pesticides. This project has shown that a combination of native beneficial arthropods, compatible soft pesticides and released parasitoid wasps for biological control can come together for a safe, yet effective pest control program.
Project Approach:	This project was to be approached in a practical way so as to be most effective for the growers involved. The main goal was that this be focused on the educational aspect for the growers first and then on the research side of the project. In developing the project, the project team decided to begin with three practical objectives. 1) Validate scale degree-day growth models through scouting and weather forecasting and develop a conifer scale warning system. 2) Educate growers through a one-on-one training with an IPM specialist regarding scale (Cryptomeria and elongate hemlock) life cycles and other IPM techniques such as scouting, growing degree-day accumulation and record keeping. Training will also include other conifer pests. 3) Hold IPM informational seminars for participating growers to learn about current pest information and research, while recommending the use of biocontrols, reduced-risk products and sustainable techniques used in an IPM system. As this project began in 2011, the project team was hopeful that we would find project participants who were not only interested in reducing or preventing the use of broad-spectrum pesticides on their farms, but who were also interested in taking a bigger step with IPM by incorporating biological controls on their farms. For this first year, there was one farm actively involved with the project (Springfield Farm in Loganville, PA) and one serving as a location to conduct temperature monitoring and scouting (Stricklers Evergreens, Elizabethtown, PA). Springfield Farm owners Jeff and Donna Bortner had not previously made insecticide applications, but were interested in using biological control to control Cryptomeria scale, an increasing problem on their farm. The project team planned a meeting with Donna Bortner for early spring of 2011 to discuss the possible

biological organisms that could be used and how the whole project would work, including the scouting that would be involved.

Prior to this meeting, the project team began to research biological control organisms of armored scale which had been used in the nursery and fruit industries, and compared them to determine which had the potential for the incorporation of this in conifer nurseries and Christmas tree farms. In evaluating the best potential product to use, the project team took several things into account: ease of release, effectiveness of the control organism, accessibility/availability of the organism and prices. The team looked at two predatory beetles (Lindorus lopanthae and Cybocephalus nipponicus), which killed the scaled by feeding on it, and two parasitoid wasps (Encarsia citrine and Aphytis melinus), which killed the scale by laying eggs inside the scale crawlers and the new baby wasp kills wasp as it grows. After evaluation, the project team and the grower selected Aphytis melinus.

Temperature monitoring was an important step of the project and one of the main objectives. Following daily temperatures and converting into growing degree days (figures derived by comparison of average daily temperatures to a base minimum temperature at which point insect development progresses) allows a grower to track progress of the season and can give an idea of when insect activity will begin. There is an accepted growing degree day (GDD) range for when Cryptomeria scale crawlers (the life stage susceptible to pesticide sprays or parasitoid attack) emerge and this range is 600 – 800 GDD for the first generation and 1,750 – 2,130 GDD for the second generation, but while working on this project, the team wanted to test how accurate this accepted range truly is. This temperature recording was conducted concurrently with scale population monitoring to determine if the growing degree day range was accurate for the scale populations in our area. Project team members tracked temperatures in Lancaster County and York County for both the 2011 and 2012 growing seasons beginning February 1st. [See Goals and Outcomes Achieved section for results.)

In March 2011, project team member Sarah Pickel began the one on one educational part of this project by meeting with Springfield farm owner Donna Bortner. The purpose of scouting visits were to train the grower in the techniques of scouting (using a hand lens properly, learning where pests can most likely be found in a tree), to help her recognize Cryptomeria scale symptoms and life stages, to recognize damage from other pests, to become familiar with the beneficial insects she will be seeing on the farm and to feel confident about what she is seeing in the field. This scouting was also beneficial to the project team in that team members were able to get a perspective of how extensive the scale infestation was throughout the farm. This would help the team to be prepared for the biocontrol release in mid-summer.

In 2011, there were approximately 10 visits to Springfield farm, where one-on-one scouting training took place on the farm. These sessions were typically two or more hours and involved walking through multiple tree blocks on the farm looking for pest issues. To focus on the scale component of the project, working in two blocks with a total of approximately 2000 Fraser fir trees (3-4 ft), the project team examined the trees for the presence of scale. Trees with scale were marked with ribbon. Farm owner Donna participated in this tagging and was very inquisitive and quick to learn the symptoms and signs of this scale, and was also interested in learning facts about the other pests. In the end of this first season, approximately 170 trees total were marked for having the presence of scale, or about 8.5%. In 2012, scouting continued at Springfield Farm, with 19 scouting visits to the farm. This season, the scouting for scale expanded to another block of trees containing approximately 1,000 trees. These trees were tagged for both Cryptomeria scale and spruce spider mite. In the trees that were scouted last year, there were more trees tagged in 2012. Approximately 100 additional trees were tagged in the two blocks scouted last season, raising the percentage to 13.5% scale infestation.

Also in 2012, Stricklers Evergreens became an active participant in the project. Farm owner Oliver Strickler met

with project team member Brian Schildt to scout, discuss and observe what was happening on his farm. There were two blocks of trees that we worked with on this farm, consisting of about 1000 trees together. There were 18 scouting visits to Strickler's farm.

There were times when project team members met with the growers to share more in-depth information about the projects. In 2011, 4 meetings were held with the Bortners and one of their farm volunteers. During these visits, articles with issues such as weed control, handouts on insecticide control, and catalogs with different biocontrol insects available for purchase were discussed. Also, during one meeting, microscopes were used so the farm employees could get a closer look at the scale pests and biocontrol insects. In 2012, project team members met twice with Donna Bortner and twice with Ollie Strickler. The topics of these meetings included what soft pesticide products were available for compatible use with a biocontrol program, the life cycle of Aphytis melinus, and the use of a microscope to observe spruce spider mite activity.

Both participating farms chose to use biocontrol and selected the parasitoid wasps, Aphytis melinus, for control of their Cryptomeria scale population. Springfield farm (Farm A) participated in a release in both the 2011 and 2012 seasons. Stricklers Evergreens (Farm B) used the wasps in the 2012 season. When the crawlers of the scale emerged, a series of three releases were made for the first generation, following a recommendation from the IPM Program at University of California, and four releases were made for the 2nd generation (because of inclement weather during one of the releases). The following chart shows the release times and amounts for both seasons:

Table 1: Chart of *Aphytis melinus* releases in 2011 & 2012

2011 Release Date	2011 Farm A Release Rate		2012 Release Date	2012 Farm A Release Rate	2012 Farm B Release Rate
6/15	30,000 (+30K partially viable from a delayed order [no cost])		6/5	60,000	40,000
6/21	30,000		6/12	60,000	40,000
6/28	30,000		6/19	60,000	40,000
8/16	40,000		8/14	60,000	40,000
8/23	40,000		8/21	60,000	40,000
8/30	40,000		8/28	60,000	40,000
9/7*	50,000		*Extra release in 2011 due to bad weather during 8/30 release.		

The wasps were delivered in plastic cups with 10,000 in each. For the release, project leaders and participants went to each marked tree and opened the cups for a few seconds to allow the wasps to fly out. The following pictures demonstrate this process.

Figure 1: IPM Program scout Sarah Pickel releasing *Aphytis melinus* at a marked tree (left); Wasp release at the base of a Fraser fir (upper right); close up of *Aphytis melinus* transport container (lower right). [Photos courtesy of Brian Schildt]

In 2011, there were approximately 12 visits to the Loganville farm where scouting and/or biocontrol release was conducted without the grower after she suffered from a boating accident. This was for the purpose of building and monitoring the parasitic wasp population to ensure successful establishment.

Prior to the 2011 Christmas retail season, project team member Sarah Pickel had the opportunity to provide educational posters to York County consumers at a holiday event known as Christmas time in Loganville. This special event takes place on the Saturday before Thanksgiving and involves businesses, churches and schools in Loganville, where each participant is a special destination for visitors. Springfield farm participates in Christmas time in Loganville and provided special retail sales, special foods for sale and early trees for sale. The poster presentation provided information on biocontrol and other IPM methods. (See Additional Information section for figures 3 & 4). Sarah was able to speak with visitors about these topics. The farm then kept the poster display for the remainder of the season to educate their customers on the use of IPM on their farm. Springfield farm will also use the poster for the 2012 Christmas time in Loganville and the remainder of their retail season.

Lastly, in the growing season of 2012, it was decided that Springfield farm should incorporate the use of the soft insecticide Movento (Bayer) for further control of Cryptomeria scale, while continuing to use the Aphytis melinus biocontrol. Two applications of Movento were made at the beginning of the crawler emergence of first generation of Cryptomeria scale. The reason for this decision was made because, although the parasitoids were clearly infecting the scale, the project team members felt that the parasitoids alone were not deterring the spread of the Cryptomeria scale. (See Tables 3, 4 & 5 in the Goals and Outcomes Achieved section.) The reason it was decided that Movento would be used is because it is compatible with the parasitoid and predator insects

found natively and introduced on the farm. The project leaders do not see this as a failure of the biocontrol, but rather as the best solution to assist the parasitoids in their control efforts.

Goals and Outcomes Achieved:

Temperature Results: Temperatures were collected in both 2011 and 2012 in York and Lancaster Counties to verify the accepted GDD range for Cryptomeria Scale. The results are listed in the table below.

Table 2: Growing Degree Day values for Scale Emergence in 2012 & 2011

Generation	Accepted GDD Range of Scale Emergence	2012 GDD Totals		2012 Emergence Date	2011 GDD Totals		2011 Emergence Date
		York	Lancaster		York	Lancaster	
1st	600 – 800	846	790	5/29	830.5	852.5	6/8
2nd	1,750 – 2,130	2641.5	2595.5	8/8	2,519.50	2,572.50	8/12

In both 2011 and 2012, the degree day totals at the time of scale crawler emergence appear to be higher than the accepted ranges of 600 – 800 GDD for the first generation and 1,750 – 2,130 GDD for the second generation. This could be due to a quick rise in early spring temperatures, which may also be the reason that the dates (2012) are earlier than usual for the scale emergence, especially for the first generation. Despite the numbers being off, there is still a benefit to tracking the temperatures. The range as it currently stands gives farmers a general idea of when to begin their scouting. It may be beneficial to broaden the range to reflect the results found in this study.

Pesticide Use: For Stricklers Evergreens, the 2012 season represents a season where insecticide was not used on the trees in the project. For Springfield Tree Farm, the 2012 showed a pesticide increase; however the product that was used was a new generation, soft pesticide which is compatible with predator and parasitoid insects that also control Cryptomeria scale. Because of the nature of the pesticide incorporated, the project team still views this as a positive outcome. The project team's original goals were to see pesticide reduction and an increase in the use of soft pesticides, so the results this season show that we were able to meet the project goals.

SCALE OBSERVATIONS: Both growing seasons, as a means of monitoring the level of parasitism in the test block, samples were taken from tagged trees where the wasps were released. A number of twigs were sampled each time and were observed under microscopes. The scales were counted and labeled as Dead, Live or Parasitized. The results from these counts are listed in the chart below.

Tables 1, 4 & 5: Scale observations after *Aphytis melinus* releases

FARM A – 2011 GROWING SEASON				
COLLECTION DATE	DEAD	LIVE	PARASITIZED	% PARASITIZED
6/21/2011	445	128	896	60.99
6/28/2011	405	73	414	46.41
7/5/2011	570	654	375	23.45
7/15/2011	795	70	1222	58.55
7/21/2011	375	63	1039	70.35
8/16/2011	165	97	97	27.02
8/23/2011	245	293	170	24.01
8/30/2011	63	76	235	62.83
AVERAGE % OF PARASITISM – 2011				**46.70**

FARM A – 2012 GROWING SEASON				
COLLECTION DATE	DEAD	LIVE	PARASITIZED	% PARASITIZED
7/10/2012	267	92	541	60.11
7/24/2012	163	70	147	38.68
8/7/2012	58	196	91	26.38
9/11/2012	139	181	42	11.60
9/24/2012	113	298	76	15.61
10/9/2012	70	333	84	17.25
AVERAGE % OF PARASITISM – 2012				**28.27**

FARM B – 2012 GROWING SEASON				
COLLECTION DATE	DEAD	ALIVE	PARASITIZED	% PARASITIZED
7/12/2012	16	191	129	38.39
7/27/2012	2	63	124	65.61
8/23/2012	39	10	21	30.00
9/14/2012	0	31	18	36.73
AVERAGE % OF PARASITISM - 2012				**42.68**

While clearly there is parasitism in the farms, the percentages are not ideal in a commercial situation, where growers would like to see control percentages as close as possible to 100%. In 2012, the project team saw a reduction of the percentage of parasitism on Farm A (Springfield Tree Farm). Whether this is because the rate of increase of the Cryptomeria scale simply is out pacing the parasitoids or whether there is a problem with the parasitoids is unclear. Project leaders believe a solution lies with the combination of the Movento and the parasitoid release, but further work is needed to confirm this.

Scouting: One clear goal for this project was that there would be an increased amount of acreage under management practices that include IPM. The fact that the growers are scouting on these two farms (approximately 12 acres total) and making management decisions based on the life stages and amount of pest presence in the field, and have embraced the use of biocontrol organisms and soft pesticides, shows that this project has met this goal.

Native Beneficials: Throughout the project, on both farms, while scouting to observe Cryptomeria scale life stages, numerous beneficial insects were observed among the scale population. The most prevalent was a native parasitoid wasp. The other type of insect that was observed was the twice-stabbed lady beetle. This is a predator that feeds on scale. Also seen were multicolored Asian lady beetles, praying mantids, several species of spider. The predator presence was higher on Springfield Tree Farm, where insecticide applications have not been made in the past, but even one season of insecticide reduction on Stricklers farm saw an increase in the beneficial insects. Even on Springfield tree farm after the application of the Movento, these predators were still present throughout the growing season. The presence of these species shows that the ecosystem of the farm is healthy and will be encouraging to biocontrol releases made to supplement the work of these native beneficials.

Consumer Outreach: An added, unexpected benefit of this project was the opportunity to reach consumers of

	Christmas trees with the innovations going on that the Springfield Farm. Through participation in Christmas Time in Loganville, the project team was able to share with some consumers that it is possible to have a more sustainably grown Christmas tree and that it is acceptable for them to look for that. Hopefully, through the use of the informational posters over this next holiday retail season, more growers can be reached with this educational message.
Beneficiaries:	The two beneficiaries directly affected by this project are Springfield Tree Farm and Stricklers Evergreens, as well as their customers. Below in the *Additional Information* section, their opinions of the project can be clearly seen. Now that results of the project have been gathered, the biocontrol information can be shared with several groups of Christmas tree growers. First of all, biocontrol information will be shared through the 2013 PA Christmas Tree Scouting Report. This report has a direct distribution list of 270 farmers, industry professionals and educators, and is also available to numerous growers online at the Penn State University Christmas Tree Website (http://ento.psu.edu/extension/christmas-trees/scouting-reports). Also, as regular presenters at the PA Christmas Tree Growers Association Meeting, project team members can include the advances made in this project in presentations to that group.
Lessons Learned:	At the end of this project, the team has worked toward and achieved the goal of educating growers through one-on-one training of scouting techniques. Weekly visits to the farms allowed the project leaders to show life stages of the scales to the growers. There was also education about other Christmas tree pests as they were discovered in the field. These included white pine weevil, spruce spider mite, pine bark adelgid, and Eriophyid mites, to name a few. After two seasons of monitoring growing degree days and finding that the accumulated total at the time of scale crawler emergence was outside the range during both seasons, led the project team to believe that perhaps this model needs to be broadened. We believe this may not be a rarity, but a new normal for this pest. This change would benefit growers by providing a longer window during which they could be scouting for Crypotmeria scale. There was some hesitance on the part of the project team to recommend pest management solutions of which we were uncertain of the outcomes. Not having experience with releasing biocontrol in a conifer plantation was risky, but knowing that the technique had worked in many other settings and situations made the step less daunting. The growers embraced the process and were pleased to find that there was a pesticide free option for pest control. The success of the parasitoids at the end of the second season is not quite what the project team had hoped. The percentages of parasitism are lower than most growers would accept. While it is clear that biocontrol releases on their own may not be the answer for complete control of a Cryptomeria infestation, the combination of a biorational pesticide product and a biocontrol may be completely effective. Another round of research may be required before the most effective combination is found.
Contact Person:	Cathy Thomas 2301 N. Cameron St, Harrisburg, PA 17110 Phone: 717-772-5204 Fax: 717-705-6518 caththomas@state.pa.us
Additional	**Grower Survey Responses:**

Information:

Question	Possible Survey Responses				
	Not at all	Very little	Somewhat	A fair amount	A great deal
1) Through this project, did you learn more about pest life cycles than you had previously known?					2/2
2) Do you feel that the scouting conducted as part of this project was valuable to your farm operation?					2/2
3) Is it important to you that your farm uses a control program using reduced-risk (soft) pesticides and/or a lower amount of pesticides?					2/2
4) Do you feel that your customers will value the fact that your farm uses a control program using reduced-risk (soft) pesticides and/or a lower amount of pesticides?					2/2
5) Do you feel that the fact that you used biological control will be a draw to customers?					2/2
6) Would you consider continuing to use biological control after the project is over?					2/2

Grower Comments:
"When it is possible to control a pest and not use a harsh chemical but do it with an environmentally control I would always choose the latter." – Oliver Strickler, Stricklers Evergreens

7) Comments:

Springfield Tree Farm is a relatively new adventure, being established in 2007. We had no past experience with Christmas Trees. It has been an ongoing learning experience. Sarah Pickel's weekly scouting visits were very educational and extremely helpful in managing problems with trees infected with pests. We were so impressed with the alternative method using biological control vs. pesticides. We prefer this for the environmental benefits, as do our customers. We would greatly appreciate participating in further studies on this project or others in the future. Donna Bortner

Figure 1: Grower Survey Excerpt from Donna Bortner of Springfield Tree Farm

SPRINGFIELD TREE FARM

"Greener" Christmas Trees: Using IPM and environmental methods to raise our trees

NATURE WORKING FOR US

Integrated Pest Management

Integrated pest management (IPM) is a multi-angle approach to pest management which stresses good sanitation and dealing with pest problems early so that the simplest control options can be used. The key to finding pest problems early is scouting. This involves looking closely at the trees for symptoms and signs of problems.

With the help of the Pennsylvania Integrated Pest Management Program (PA IPM) from the Pennsylvania Department of Agriculture, we've been carefully examining the trees on our farm to locate typical problem insects such as Cryptomeria scale and spruce spider mites. This has allowed us to utilize alternative control methods.

Twice-stabbed lady beetle, *Chilocorus kuwanae* Photo: D. Bortner

Biological Control

Biological Control, or the agricultural practice of using beneficial organisms (insects, mites, fungi, etc.) to control pest organisms is used worldwide. It's a natural way for farmers to keep pest populations in check. There are numerous beneficial insects found in farms, forests and our own backyards. By cultivating a sustainable environment for these beneficials, they can be important allies in the battle against unwanted insects and mites. Some common Christmas tree pests that can be fully or partially managed with beneficial insects are adelgids, aphids, scale insects and spider mites.

Aspidiotus cryptomeriae, or Cryptomeria scale, one of the common pests on many PA tree farms. Photo: S. Pickel, PDA

Collaboration

In 2010, the PA IPM Program reached out to our farm as a potential partner in a grant project for studying biocontrols in Christmas trees. This is a project funded by the USDA's Specialty Crop Block Grant Program. The PA IPM team began visiting our farm to scout for pest issues, to observe the presence of beneficial insects and then to release commercially produced biological organisms.

Brian Schildt and Sarah Pickel of the PA IPM Program team during a summer bio-control release at Springfield Tree Farm. Photo: C. Thomas

At Springfield Tree Farm, we've decided to let beneficial insects help with pests that could be found around our farm.

Cryptomeria scale damage on Fraser fir. Photo: S. Gardosik, PDA

The Natives

A number of species of native beneficial insects can be found on this farm. These insects are working members of our control team.

Twice-stabbed lady beetle larva, *Chilocorus kuwanae*. Photo: S. Pickel

The first insect is the twice-stabbed lady beetle. Both the adult and larva stages of this insect feed on unwanted insects. This and other members of the lady beetle (or ladybug) family are great assets to any farm or garden. Other insects that we've seen on the farm are praying mantises, green lacewings, and Syrphid flies, all of which feed on pest insects.

Another important insect found on the farm is a native species of *Aphytis* wasp. These wasp are a well-known parasitoid of armored scales. (See below for more details on parasitoids.) The PA IPM Program staff is monitoring numbers of these wasps to see how effective they are at controlling scale insects.

Aphytis spp. parasitoid. Photo: S. Pickel

Aphytis melinus, or Golden Chalcid wasp, laying an egg underneath the covering of a California red scale. Photo: J.K. Clark

Sarah Pickel, PA IPM Program staff member releasing *Aphytis* wasps at a marked tree. Photo: B. Schildt

Unleashing an Army

Aphytis melinus, or Golden Chalcid wasp. Photo: J.K. Clark, UC

Through the release of a very tiny wasp known as the Golden chalcid (*Aphytis melinus*), we are trying to control our pest problems in a natural way.

This wasp is a parasitoid, meaning it lives on or within its host insect, ultimately killing it. This wasp lays its eggs under the covering of the nymph (juvenile stage) of a Cryptomeria scale insect, which feeds on conifer needles and can cause needle discoloration. The wasp egg hatches into a larva, which feeds on the scale as it develops. The wasp larva eventually kills the scale and will emerge from the scale body as a mature adult wasp, ready to lay its eggs in other scales, continuing the control process.

The Aphytis life cycle takes about 48 days to complete. They will continue to reproduce throughout the growing season, however they will not overwinter, so a new batch of wasps must be released next spring. The pictures on the right show the process of the *Aphytis* release.

Note: This wasp is microscopic and completely harmless to Humans!

Aphytis melinus are delivered in cups of 10,000. The wasps were released at a rate of 40,000/2 acres. Photo: B. Schildt

More questions on IPM? Visit ww.paipm.org.

Figures 2 & 4: Informational IPM Posters used by participating grower to educate consumers. [Produced by S. Pickel]

Project Title:	**Direct Farm Sales Program, Project 12**
Project Summary:	The Direct Farm Sales Program was conducted by the Pennsylvania Department of Agriculture's Bureau of Food Distribution. The Bureau was responsible for managing the application process, determination of grant qualifications, and the execution of monetary awards. The Bureau was also responsible for verification of individual project completion, collecting data pertaining to outreach and reporting information to the Pennsylvania Department of Agriculture Bureau of Markets. The grants were awarded to farm stands, farmers' markets, government units, and nonprofit organizations that manage and operate farmers' markets located in Pennsylvania. All grantees completed and submitted an application by the established deadline. The program operated from March 1, 2011 through September 30, 2011. There were a total of 113 applications for the 2011 program. Each application was evaluated on the following criteria: The potential to increase consumption of Pennsylvania grown specialty crops, preservation of farmland and promotion of agriculture; the readiness for the applicant to complete the project; potential for the market to assist in revitalizing a community; location of market in an underserved area; potential to provide increased access to farmers' markets by FMNP program participants; number of people served and the overall performance of the project. The project issue was to provide fresh, locally grown specialty crops to low income Pennsylvania citizens, while expanding the number of outlets, the awareness, use of and sales at farm markets and farm stand to build a positive behavior for eating more nutritious food to reduce the incidence of hunger and under nutrition in Pennsylvania.
Project Approach:	Once project have been selected for funding all budgeted line items are reviewed to ensure that each line item is allowable and will result in the increase of specialty crops. Funds are only dispersed after projects have submitted receipts. Receipts are compared to the approved project budget to ensure only allowable costs are reimbursed. In some cases, non-specialty crop items have indirectly benefited from completion of some of the projects. Allowable costs are determined using the specialty crops federal regulations and consulting with Pennsylvania's Specialty Crops Block grant administrator. The mini project costs cover, advertising and other promotional costs, nutrition education materials, staffing costs associated with the project, signage directing people to the market, website development to advertise the market and goods available for sale, and market tables, tents, bins, etc used to display and protect crops for sale. The focus of the majority of the projects this year was on promotion of the farm stand or farmers market with the goal of increasing the sale of specialty crops. Several projects resulted in the creation of new farm stands or farmers markets. Three projects are highlighted below. The Penns Valley Cooperative Farmers Market combined the resources of two small farmers markets in order to attract more customers and vendors in the underserved rural area. A new farm stand was created in the Shenandoah Summer Nutrition Program. The market made available fresh produce that the city residents would not have had access to. The Market had weekend hours, which was an added benefit for customers. The project also allowed youth in the community to learn about nutrition and farm produce. The Easton Farmers Market is located within walking distance of a food desert neighborhood. Community

	outreach focused on this neighborhood with special vouchers used to encourage residents to go to the market. The market recruited a resident from the neighborhood to lead a group to the market each week.
Goals and Outcomes Achieved:	The goals and outcomes that were achieved by each grantee are listed separately below. 1. The Snipes Farm & Education Center achieved their project goal of lighting their CSA distribution room and also installed outdoor lighting along the path to their parking lot. 2. Penn's Valley Cooperative Farmers Market was able to add eight new vendors to the markets and increased customer sales by 25-30%. 3. The Collegeville Farmers Market had several project goals which they accomplished. Surveys were conducted that showed that the market was attracting customers from outside the community. Businesses in the community noticed an increase in foot traffic within their stores when the market was in operation. Vendors at the market produced the majority of their product within 30 miles of the market. Local college students assisted with the creation of the market's Facebook page and helped create a student discount program to encourage their use of the market. 4. The Easton Farmers markets educated children and families about farm to table eating and shopping with EBT at the Easton Market. As a result EBT sales increased 20% over the previous year. 5. Cooper Farm Market was able to promote the farm stand and produce grown on the farm, hosted school groups, head start and low income family groups at educational sessions held at the market, and advertised on the radio and internet to attract a larger customer base. 6. Advertisements in several local newspapers allowed the Main Street Farmers Market in Washington PA to increase their overall attendance at the market this year, which resulted in increased sales. 7. Strites Orchard's primary project goal was to increase consumer awareness of the orchard. As a result of the project they gained 1000 new Facebook followers and continue to see new customers at their market. 8. Ard's Farm created a new web page. Part of this new web page included a Local Vendors page that included information on vendors selling their products at Ard's Farm market. 9. Kathy Brenneman created a farm stand for the sale of local honey and bouquets of flowers. 10. A mobile farm stand has been created for use in selling produce in 2012. 11. Goals for the Ferry Street Growers market were to promote PA locally grown produce and promote the market. The market was able to achieve both of these objectives. 12. Beaver County Farmers Market goal this year was to make the market more visible in the community. The market created a Facebook page and used a color printer and laminator to create signage for vendors in the market. The market also featured several cooking demonstrations. Consumers indicated in completed survey that they really enjoy the cooking demonstrations. Comments received on the Facebook page will be used to improve the market in the future. 13. The farm stand at Green Hills Farm was to have sales of $4000. This goal was exceeded by 40%. They promoted the market using ads and coupons in local newspapers and on Facebook. Facebook provided them with the ability to educate consumers on products that were available. 14. Harvest Moon's project goal was to increase sales with visitors to the town. This was accomplished using several different newspapers. Many visitors did stop at this market. 15. The Somerset Farmers market hired a market coordinator who promoted the market and coordinated educational programs. 16. Weavers Way Community Programs operated two different farm stands. The Chestnut Hill farm stand was very successful, but the Stenton market was very slow despite promotion of this market. 17. Hurry Hill Maple farm stand created a website, developed educational materials, staffed a taste and tour weekend and purchased display materials. These efforts resulted in increased sales of their pure maple syrup. 18. Advertising allowed Vandergrift Farmers' Market to increase attendance at their market and vendor sales. 19. Manna on Main Street hired a market manager to meet their project goals. The manager implemented a SNAP EBT program at the market, increased sales utilizing several promotions programs, and completed customer surveys to use for future market improvements.

	20. A marketing plan was used by Gray Wolf Plantation increase customer awareness of the farm stand. Surveys conducted showed where customers live in relation to the stand location. Several customers came from out–of-state. 21. Keystone College created a farm stand on their campus for students, staff, and the community to use to access locally grown fruits and vegetables. 22. Goodell Gardens Farmers Market used promotion to double the weekly market attendance. They also recruited new farmers to the market 23. Wyck's Hone Farm and Farmers Market was able to fulfill their primary goal of serving members of their community for which food security is a concern by providing affordable chemical-free produce. 24. Clarion County Farmers Market Association used radio advertising, signs along the interstate and signs at major intersections to draw new customers into the market. 25. Nature Nurture Center used project funds to promote 12 producer-only farmers' markets in the Greater Lehigh Valley. All 12 markets indicated that the promotional efforts increased attendance at markets. Surveys showed that consumers spent 23% more at the farmers' markets than in the last year. 26. Increasing the number of specialty crop vendors and promotion were the goals of the Lansdowne Farmers Market. Four new specialty crop vendors were added and weekly attendance at the market also increased. 27. Foundations, Inc. created a palm card to increase awareness of the foodscape in the West Oak Lane neighborhood. The card contained locations where fresh produce could be purchased. 28. The Cellar Market in State College increased awareness of the market and products being sold and introduced several new vegetables not normally grown in PA to local consumers. 29. The Kane Farmers market used promotion to expand the market and consumers awareness of fresh locally grown produce. 30. Anselma Farmers' and Artisans' markets goals were to hire a market staff person to set up, manage and operate the market and to promote and advertise the market. Both goals were accomplished which resulted in increased attendance at the market. 31. Weavers Orchards provided classes on preserving locally grown fruits and vegetables, created opportunities for individuals to experience their local farm, and promoted the sale of locally grown produce. 32. The Adam's County Farmers' Market Association implemented serval methods to increase access to locally grown food, which included a SNAP EBT system, advertising, direct mail promotion and Facebook page. 33. The Mansfield Growers Market increased their customer base, increased awareness of nutritional benefits of local organic food, and utilized sidewalk signs as a reminder that the market was open. 34. The Food Trust created a new farmers market in Northeast Philadelphia where there were no farmers markets. They attracted two specialty crops farmers to this new market. They promoted the market, and conducted outreach to bring customers into the market. They are working on strengthening this market and extending the market season. While that goal of increasing FMNP checks redeemed from 75% to 80% throughout the state was not accomplished many of the projects funded did increase the redemption at their market over the previous year. In some cases the amount redeemed was double the previous year. We achieved our goal of having 100 applications for the mini grants by receiving 113 applications for this grant period. Since we do not know how many of the projects had PA Preferred vendors prior to the start of the project we are unable to determine in the number of PA Preferred vendors increased. Some project outcomes are as follows: 1. The majority of the grant recipients would participate in the program again. 2. The infrastructure improvements at Snipes Farm & Education Center enhanced customers experience on the farm and helped to improve sales and the viability of the farm. 3. Children walked to the Shenandoah farm stand to purchase single pieces of fruit using pocket change. Also

	seniors that don't drive were able to walk to the stand to purchase fresh produce. 4. The Mansfield Growers Market now have customers indicating that they don't buy items at major retailers that they can purchase at the market. Some of the goals and outcomes that were not achieved by grant recipients are listed below along with future project plans. 1. The stand selling local honey and flower bouquets experienced problems with lack of honey and wild animals destroying the flowers. These problems resulted in the closing of the stand for a period of time. The stand has since reopened to sell honey. 2. September flooding caused Weavers Way Community Farmers Markets not to meet all of their project sales goals because of the produce being destroyed. 3. Vandergrift Farmers Market did not implement and EBT system at the market because a cost analysis showed that the system would have superseded the benefits because so few shoppers would have utilized this system. 4. Weather conditions played a major role in delaying the start date for the Gray Wolf Plantation opening date from July to September. 5. Keystone College had tremendous interest in creating a CSA hybrid program and will work in the future on its creation. Note: There were two projects which were not completed this year for a variety of reasons which include: lack of match funds and did not have time to complete the project. The projects did not receive any specialty crops block grant funds since they did not submit any receipts for reimbursement.
Beneficiaries:	Over 45,630 people benefited from this year's Direct Farm grant projects. This number doesn't include the number of farmers and other vendors that benefit directly and indirectly from the Direct Farm sales grant projects. The number of PA Preferred producers that participated in Direct Farm sales grant projects in 2011 were 122. There were approximately 14, 981 FMNP checks received by farmers benefiting from Direct Farm Sales Grant projects. Since this program ended September 30 and the FMNP doesn't end until November 30th these numbers are not final yearly numbers.
Lessons Learned:	The following are lessons learned that our projects shared with us in their final evaluation reports: The Collegeville Farmers Market plans on working with their County Extension Office in 2012 to have educational courses taught at the market along with producing healthy eating articles for distribution at the market. The Shenandoah Summer Nutrition Program received a tremendous amount of support from the community which included help renovating the building space used for the market and local churches advertising the market. The Main Street Washington market plans to continue working to increase the use of SNAP EBT benefits at the market by focusing on work with community groups, church groups, the PA Department of Welfare and other organizations over the winter months in preparations for the 2012 market. The Kennett Square Farmers Market was not completely aware of the PA Preferred Program, but will make an effort to reach out to their vendors regarding the program. Due to low sales at the Stenton farm stand Weavers Way Community Program created a traveling farmers

	market which they took to a senior center where again sales were slow. When surveying the senior they found that seniors were saving their FMNP check to use closer to Thanksgiving. Having a greater pool of volunteers to draw from in order to not overstretch the current volunteer base would be beneficial. Keystone College's major challenge this year was not connecting with small farmers prior to seed orders so that they did not plant ample crops to support a new market. This is being corrected as they move forward. Foundations, Inc. used high school students to run their markets. While they gained critical skills in organization, management, customer services, and marketing they sometimes get overwhelmed with responsibility when there were a lot of customers at the farm stand and where not able to track the number of customers served.
Contact Person:	Sandy Hopple, The Pennsylvania Department of Agriculture, Bureau of Food Distribution, 2301 North Cameron Street, Harrisburg, PA 17710, 717-772-2693

Project Title:	**Bureau of Market Development, PA Preferred, Project 13**
Activities Performed:	This project is composed of three specific activities which are inter-linked to strengthen state brand recognition of specialty crops, improve communication between farm and fork, and increase farm profit margins through increased specialty crops sales. The three projects consisted of; Good Agricultural Practices (GAP Cost Share Program), Center for Farm Transitions (CFT), and the Pennsylvania Preferred state branding program (PA Preferred™). **Project 1 Good Agricultural Practices (GAP Cost Share Program) -** The Pennsylvania Department of Agriculture recognized the necessity of employing rigorous on-the-farm food safety practices. Expansion of the Good Agricultural Practices (GAP) Education Program and the inclusion of cost share incentives helped maintain a safe food supply and the economic well-being of the agricultural community. The collaboration among government officials, University and industry experts ensured that the greater awareness and necessity of implementing on-the-farm food safety practices. Training occurred. A cost share incentive was offered to produce operations, which successfully passed a federal/state Good Agricultural Practices audit in 2010 and 2011. Qualified applicants received up to $400 per year for passing the federal/state audit for the first time, and $200 for passing an audit for the second or more years. The activity is administered by the Pennsylvania Department of Agriculture (Department) through applications made available on its website (PDA GAP/GHP Cost Share Program) and through paper applications made available upon request, by auditors and at various trade shows. Baseline Information: When Pennsylvania first started offering the GAP/GHP cost share in 2008 less than 20 producers in Pennsylvania were participating in the voluntary GAP/GHP audit program. The program received 40 applications in the first year (2008) of the program and 81 applications in year two (2009) representing a better than 100 percent increase. A more modest increase in anticipation was anticipated for the 2010 growing season of 20 percent leading to an expected 95 applications. The advisory group established to advise the Department with this activity, which included stakeholders from fruit, vegetable and mushroom growers associations assembled to address the cost share program recommended to set the cost share amount at a maximum of $400 to maintain a good return for producers and ensure funds would be available for the maximum amount participants. This decision was continued for the

2010 and 2011 growing seasons.

Target:
A total of $70,000 was budgeted in anticipation of 175 applications. The Department expected to receive 95 applications for 2010 growing season and 125 applications for the 2011 growing season. The calculations for anticipated numbers of applications were based on historic data and experience with similar cost share programs. It anticipated approximate growth of 20 percent year over year.

The 2010 anticipated applications figure included partial funding for 2010 growing season applications under the previous FFYs 09/10 SCBG 12-25-B-0946. The $70,000 in budgeted funding for applications under the current agreement was expected to provide for approximately 50 applications in 2010 and 125 applications in 2011 for total of 175 applications funded at $400 each.

Significant Results and Accomplishments:
As of the date of this report 28 applications (in addition to the 48 applications processed under the FFY 09/10 12-25-B-0946 SCBG agreement) were received for the 2010 growing season. The total number of applications received for 2010 is 76, representing a 20 percent downward deviation from the expected 95 applications. The Department imposed application deadline for 2010 has passed.

A total of 28 applications have been received for the 2011 growing season, applications are still be accepted by the Department with an application deadline of January 15, 2012 for the 2011 growing season. The current number of received applications indicates the possibility of another drop off in the number of total applications from the expected amount.

Outreach continues on the Department website, through Department officials in the Bureau of Food Safety and the Bureau of Market Development and through Department participation in trade shows related to the specialty crops industry.

Project 2 Center for Farm Transitions – Based on the studies of PDA, Center for Farm Transitions during 2008 and 2009 it is believed that approximately 3,500 individuals are seeking to become farmers in Pennsylvania which do not have access to capital, land, technical information regarding farming, requisite experience, or an appropriate understanding of a successful agricultural business management model. This project was initially going to target a minimum of 100 clients, by providing information through a mutual exploration process to each participant regarding their values, career and business goals, strengths and weaknesses, technical information gaps, experience needs, capital needs, land needs, and support needs. The process leads to an individualized written transitions plan that functions as a road map to guide the participant in achieving their goals of launching a successful agricultural farming operation and providing for career longevity in a farming.

New Tools for New/Beginning Farmers (NT) combines technical assistance and business development planning to maximize the profit potential for new/beginning farmers. The target audience is beginning farmers: (a) with less than six years of related agricultural experience; (b) have never owned a farm; (c) have not had any prior ownership interest in a land parcel, which exceeds thirty percent (30%) on the median farm size in the county in which the land is located; and (d) will benefit from the program. Key to this program is the role and value of specialty crops as an integral part of a business plan to maximize profitability for new/beginning farmers. The beneficiaries would have been individuals desiring to enter the agricultural business. Due to unforeseen circumstances and key staff issues within the Department of Agriculture this project was unable to meet valuable program objectives and funding was amended to another project.

	Project 3 PA Preferred™, state branding program - The PA Preferred™ has been successful in conducting events to promote specialty crops through several trade shows and specialty crop featured events. First, PDA assisted Tallman Potatoes and Masser with their booth merchandizing of potato products at the 2011 Produce Marketing Association (PMA) trade show. We assisted with distribution of sales and marketing materials to promote Pennsylvania potato industry. There were nearly 18,000 people visiting trade booths. Each booth proudly displayed PA Preferred banners. In the summer of 2011, PA Preferred represented the specialty crop horticultural producers at the largest 'green' show PANTS (PA Nursery and Landscape). More than 5,000 attendees visited PA Preferred companies. There were 2,500 exhibitors with nearly 100 of those being PA Preferred companies. We provided plant tags, banners, and continue to sign up new members. The next event was the Ag Progress day event in Rock Springs, Pennsylvania. The PA Preferred brand was represented by several different commodity groups as they sold fresh and value added products. It is primarily a research demonstration event, lasting three days with nearly 12,000 producers, researchers and vendors learning about innovative production practices along with marketing tips on how to enhance the sales of their product. The year wraps up with the PA Farm Show reception drawing nearly 1,000 attendees to the PA Farm Show. Specialty Crop foods are showcased in a variety of ways to demonstrate the diverse agricultural bounty Pennsylvania has to offer. Producers are recognized, county of origin and samples are made available. It is a fantastic event to show case 'farm gate to dinner plate'. The staff also assisted with the organizing of the Culinary Connection, a cooking demonstration which featured a recipe book and specialty crop meal preparation by celebrity chefs. This multiple day event showcased the delicious and interesting ways specialty crop food items make their way from farm to fork. PA Preferred, specialty crops were featured at the PA Gourmet Show (wine and mushrooms) at the first ever event in York, Pennsylvania. 1,500 people visited event to learn how to use Pennsylvania products in the daily living and make it a part of healthy choices. Lastly, we have completed our first buyer vendor show at SYSCO. There were 6 new PA Preferred vendors seeking to have their products slotted with SYSCO for distribution. The event featured 24 PA Preferred™ suppliers and a variety of items in stock. We have added 75 new members to the PA Preferred membership list. Several of these companies have seen their products gain access to wholesale distribution and retail outlets. On October 27th, 2011 Governor Corbett signed a bill making PA Preferred™ the permanent branding program for the agricultural commodities produced in Pennsylvania. We expect that the program will continue to gain additional support and permanency among retailers and vendors.
Problems and Delays:	**Project 1 Good Agricultural Practices (GAP Cost Share Program) –** The overall rate of growth in participation in the program as it relates overall to GAP/GHP cost share activity of Project #2 appears to be reaching a plateau. It can be expected that every program moves towards a critical mass of participation even if growth is anticipated year over year. Further, the increased influence of retailers in determining the acceptable audit standards (anecdotally) appears to be moving producers to third-part auditors. The program under this activity only provides funding for USDA approved audits. It may be prudent to begin the discussion of allowing GAP/GHP cost share funds to also provide reimbursement for these third-party audits as the producer or handler is often put in the position of needing these audits based solely on retailer expectations. **Project 2 Center for Farm Transitions –** Due to key staff retiring this project was abandoned. **Project 3 PA Preferred™, state branding program –** The Bureau of Market Development Staff was furloughed over the last year and current staff struggled to maintain a presence at each event. The hire of a full time PA Preferred Coordinator in May has made it possible to coordinate future events.
Future Project Plans:	**Project 1 Good Agricultural Practices (GAP Cost Share Program) –** Consider extending the deadline for 2011 growing season applications and make additional marketing pushes to elicit applications from the agriculture

	community. Engage larger grower cooperatives in helping to promote participation in the program. Consider expanding the program to include funding third-part audits. **Project 2 Center for Farm Transitions –** This project was abandoned due to key staff retiring. A new project has been proposed to utilize all funding. **Project 3 PA Preferred™, state branding program –** With the hire of a PA Preferred Coordinator, staff will use remaining grant funds to prepare for the 2013 Farm Show and Culinary Connection.
Project Title:	**Good Agricultural Practices Bilingual Training and Education Program for PA's Produce Industry, Project 14, Activity 4**
Project Summary:	Food safety concerns have been a top priority for many Pennsylvania retailers, processors, farmers, and consumers. Heightened consumer interest and the retail food industry in the safety of their local produce are at the forefront specialty crop industry. The last 2 years' Good Agricultural Practices (GAP) training and educational programs was a very successful program. The Pennsylvania Department of Agriculture proposes to continue and further expand the training and educational outreach program by working in conjunction with Penn State, Penn State Extension Educators, PennTAP, and Delaware Valley College. The bilingual program will provide Pennsylvania Produce growers and farm workers with the knowledge and awareness of the food safety tools necessary to minimize food safety risks in Pennsylvania farms and orchards. A farmer and their workers who practices Good Agricultural Practices implements proactive food safety control measures to prevent cross contamination. In addition, current cost share incentives for a farmer passing a Federal/State GAP audit will enhance program participation and continue providing financial assistance for increasing grower costs. The program will include the training and education for the successful implementation of Good Agriculture Practices program on the farm as well as worker training for the enhancement of food safety concerns on the farm. Increased food safety on and off the farm is vital to the competiveness of Pennsylvania produce.
Additional Information:	The Bureau of Food Safety, the lead for this project, experienced senior leadership changes with the departure of the Bureau Director, Bill Chirdon. Therefore, this project is being amended to fully utilize the remaining funds. A revised project was presented to fully utilize existing funds as well as an amendment for a one year extension. The new project is called "Good Agricultural Practices Training and Support for Pennsylvania Fresh Produce Growers" and will be administered by Dr. Luke LaBorde at The Pennsylvania State University.
Project Title:	**Using Biological Inoculants to Enhance Establishment, Stand and Yield in Raspberries and Strawberries, Project 15**
Project Summary:	Mid-Atlantic produced raspberries and strawberries have regularly demonstrated the ability to provide favorable returns on producer investments. Consumers have increased their demand for locally-grown products and are generally concerned about pesticide residues on their food. Both producers and consumers view land stewardship and sustainable practices as important in their decision making. Thus the stage is set for producers to adopt long-term pest management practices that increase sustainability and for alternatives to chemical disease control and preplant soil fumigation. When compared to annual vegetable crops such as sweet corn and tomatoes, raspberries and strawberries require large investments in land preparation, irrigation and plant materials. As land area becomes more of a limiting factor, growers are often forced to create new plantings

using a shorter than optimum rotation plan. In this situation, fumigation often becomes the most viable preplant treatment for disease prevention. Fumigants carry poison labels, require specific training prior to application, and are often identified by environmental groups as among the most damaging to the ecosystem of all farm pesticides. Biological inoculants such as RootShield and Actinovate, have shown enormous potential to protect crops from many root-borne diseases, thus replacing the need to use chemical fumigants. This project evaluated those biological inoculants that currently carry EPA labels for their ability to increase vigor, prevent soil-borne diseases and their impact on crop yields.

Project Approach:

Five beneficial fungi or bacteria were applied to replicated blocks of Chandler (cv.) strawberries and Jewel (cv.) black raspberries. All treatments were applied as preplant root drenches with a reapplication at approximately 10 weeks after the original installation. Once planted a fertilization and disease management program began based on seasonal conditions and crop requirements based on plant tissue analysis.

Root Inoculant treatments:

1) Water: This was our control to provide a benchmark for general levels of local disease pressure. No additional root drench was applied other than a starter fertilizer.
2) RootShield plus Companion: Other root drench programs have indicated a synergistic effect when combining a beneficial fungi (Trichoderma harzianum) with a beneficial bacteria (B. subtillus). The RootShield was applied at 4 oz/ 100 gallons and the Companion at 10 ml / 5 gallons of drench solution.
3) RootShield plus Rootmate: This was packaged by the BioWorks Company as RSSI and is applied at 8oz/ 100 gallons of drench solution. This is a combination of Trichoderma harzianum and T. virens.
4) Companion plus Actinovate: As in treatment #2, this is combination of a beneficial fungi with a bacteria. Companion (B. subtillus) and Actinovate (Streptomyces lydicus) were applied as a root drench, Companion at 10 ml/ 5 gallons and Actinovate at 5 grams/ 5 gallons.
5) Vermicompost Tea: The Fertrell Company loaned us a Vermicompost brewing apparatus for another trial on tomatoes. That same undiluted solution was applied as a preplant drench to the roots.

A planting of Chandler (cv.) strawberries was installed at SEAREC in early September 2011 with an anticipated harvest set for May / June 2012. Another planting at Kuhn's Orchards, Cashtown, PA, using the same treatments was originally installed in August of 2010 and was renovated for this project. See attached supplementary report: "**Supplemental Report:** Strawberry plasticulture survival values".

Two grower / partners worked with this project: Kuhns Orchards and Twin Springs Fruit Farm. Both provided land, equipment and support staff to install, maintain, and harvest berries on their farms. As reported earlier, irrigation limitations due to the severe drought during this project at Twin Springs negatively impacted the establishment of the plantings on that farm sufficiently to remove those results from consideration. Simply put, less than 50% of strawberry plants survived planting and there was no consistent pattern across treatments. Kuhn's Orchards has considerable irrigation resources, so was able to maintain their plantings even through the driest period. See table below with results from Kuhns Orchards:

Treatment	% Survival	Yield per plant (ounces)	Yield per acre (based on 14,500 plants per acre in pounds)
Water control 1	87	14	11,038
Water control 2	89	13	10,453
Root Shield plus Companion 1	92	17	14,140
Root Shield plus	93	15	12,676

Companion 2			
RSSI 1	89	14	11,292
RSSI 2	93	15	12,676
Companion plus Actinovate 1	92	14	11,673
Companion plus Actinovate 2	94	13	11,040
Vermicompost Tea 1	86	13	10,100
Vermicompost Tea 2	89	14	12,292

What is most evident from these results coupled with the supplementary report on plant survival from the planting at the Penn State Southeast Research and Extension Center is that plant survival has the greatest impact on marketable yields. The variance in yields per plant was minimal, however plant losses rapidly impact yields. Both the Vermicompost Tea and water control treatments resulted in fewer plants surviving to produce fruit.

These results are consistent with related work on tomatoes and floral crops. When combinations of biological inoculants such as RootShield plus Companion, RSSI (now marketed as RootShield Plus), and Companion plus Actinovate are applied proactively plant survival values increase, thus yields and grower sustainability improve.

Principal Investigator response:
-We installed 3 strawberry plantings and one raspberry planting using various promising combinations of biological inoculants. The evaluation of data from these plantings has been used to develop a growing series of articles and power points that have been presented at grower meetings and are still in use for this purpose. In addition, articles have been created that address the uses for biological inoculants as alternatives to traditional chemical fungicides / bactericides.
-Results have been presented at the following grower meetings (Major: more than70 participants): '2012 only'

1) Professional Pest Managers School, December 10, 2012, Grantville, PA
2)Fertrell Dealer Training, December17, 2012, Lancaster, PA
3)Quarryville Vegetable Growers Meeting, December 12, 2012, Quarryville, PA
4) High Tunnel Short Course, November 13 & 14, 2012, Lancaster, PA
5)Flower Trial Field Day, July26, 2012
6)State Master Gardeners Conference, June 23, 2012
7)Bucks County Vegetable Grower Meeting, March 15, 2012, Doylestown, PA
8) Tri-County Vegetable / Small Fruit Growers Meeting, 2/22/12, Shippensburg, PA
9)Ohio Produce Growers Congress, January 16 and 17, 2012, Sandusky, OH

-We are still surveying growers as our goal is to look at adoption of biological inoculants as well as intent to adopt. Program surveys that are in use for the 2012-2013 grower winter meeting season include questions on adoption of biological inoculants based on knowledge gained at programs.

Goals and Outcomes Achieved:

See results as outlined above.
One of the benefits of doing research work in the field at grower / cooperator farms and at Penn State College of Agriculture research facilities is that we are working under real world conditions, so the results can be rapidly translated into recommendations and adoption. One of the most serious diseases of strawberry plantings in the Mid-Atlantic is Strawberry anthracnose, Colletotrichum acutatum. Typical responses to this disease have been the heavy application of fungicides and often the destruction of the planting. In our planting at the Penn State

	Southeast Research and Extension Center, we had the opportunity to directly compare various biological inoculants against this disease. Our supply of plants came in with this disease. This was not discovered until the plants were well established. The treatments with Actinovate, Actinovate plus Cease, RootShield Plus and RootShield Plus + Cease all had survival rates of 94% plus while the water (untreated) control suffered 28-35% losses. This information as published in a supplementary report to this project has been widely circulated to growers. All of the PA growers that produce August planted strawberry plugs now apply one or more biological inoculants based on this projects results. The PI helped to establish the network of growers in PA that produce the vast amount of Chandler cv. June-Bearing strawberries. Continuing support to this network provided a rapid information stream for this group of adopters. Surveying growers at the 2012 Mid-Atlantic Fruit and Vegetable Conference (January 28-31, 2013) includes a section of knowledge and adoption of biological inoculants. Those results will be ready by March 2013. Other winter vegetable grower meetings are including similar sections. A summary of those results will be provided as a project supplementary report. This project did spawn a follow-up project that is evaluating a wider range of biological inoculants in the establishment and yield of day-neutral strawberries in growing media. Those results will be available in late 2012 or early 2013.
Beneficiaries:	The most immediate beneficiaries have been small fruit growers that use August-installed, plug strawberries. Suppliers of strawberry 'tips' have been regularly challenged with outbreaks of Strawberry anthracnose. Finding a proactive approach that meets this challenge once the plants leave the tip production facilities, then arrive at rooting facilities before finagling getting installed at grower farms is necessary in order to keep strawberry growing sustainable in the Mid-Atlantic. The current network of plug producers cooperating with the Produces approximately 1,400,000 rooted plugs per year. At 14,700 plants per acre, this is enough strawberry plants to plant in excess of 95 acres. Using the conservative value of #.75 of fruit per plant per season and each quart weighing approximately #1.25, that is a wholesale value of $210,000 at $2.50/ quart. A strong, proactive response to this disease supports the sustainability of this network. A more complete image of the adoption of project goals will come with completion of this season's grower surveys.
Lessons Learned:	The single lesson learned from the project is the need to include the proactive application of biological inoculants in combination at planting in order to insure a successful installation. The overwhelming results in the trials at the PSU SEAREC drive that point home. This is consistent with non-replicated results at grower farms that indicated the need for this project.
Contact Person:	Steve Bogash, Horticulture Educator, Penn State Cooperative Extension 717-263-9226 ext 230 Smb13@psu.edu

Additional Information:	 **Planting at Kuhn's Orchards - August 2010** **(Each row is one treatment)**

Planting at Kuhn's Orchards - showing spring regrowth prior to bloom.

Supplemental Report: Strawberry plasticulture survival values

Project Title:
Using Biological Inoculants to Enhance Establishment, Stand and Yield in Raspberries and Strawberries.

Summary:
On September 5, 2011, a replicated trial of Chandler cv. strawberry plugs was installed at the Penn State Southeast Research and Extension Center. Each plot consisted of 50 Chandler cv. strawberry transplants that had been rooted in 50 cell trays. Prior to planting the plugs were drenched with one of root inoculants treatments. Shortly after taking delivery and installing the transplants, we were notified by the grower that he had received notice from his strawberry tip suppliers in North Carolina that their State inspectors had identified Strawberry Anthracnose (Colletotrichum fragariae) in several of the planting's that the tips were harvested from. Diagnosis by the Pennsylvania Department of Agriculture Pathology Laboratory confirmed that the plants installed as part of this project were also infected. This provided an opportunity to compare survival rates of newly planted strawberry plugs using various root inoculants treatments. This is a supplemental report. Follow-up reports plus a final version will be forthcoming after the spring 2012 end of dormancy.

Treatments:
-Water: control
-Actinovate: Streptomyces lydicus, strain WYEC 108

-RSSI: RootShield, Trichoderma harzianum Rafia strain T-22 plus RootMate, T. virens
-RootShield plus Companion: T. Harzianum Rafia strain T-22, plus Companion, Bacillus subtillus GB03
-Companion plus Actinovate: B. subtillusGB03, plus S. lydicus, strain WYEC 108
-RSSI plus Companion: T. harzianum, plus T. virens, plus B. subtillusGB03

Results:

Treatment	Plants installed	Plants survived	% survival
Water / control	199	143	72%
Actinovate	200	197	99%
RSSI (RootShield plus RootMate)	200	167	84%
RootShield plus Companion	200	159	80%
Companion plus Actinovate	200	194	97%
RSSI plus Companion	200	176	88%

Conclusion(s):
In this early snapshot of this study, there are significant differences between treatments and especially between non-treated (water-control) and beneficial biologically drenched plants survival under the pressure of Strawberry Anthracnose infection. Actinovate and Companion plus Actinovate show a marked improvement in plant survival over other treatments. This planting will be re-evaluated once it breaks winter dormancy in Early April.

Note from early April 2012 reevaluation: Survival values precisely matched those from this report to the plant. Once the plants 'weathered' Strawberry Anthracnose, the relatively mild winter did not produce any new challenges to survival.

Project Title: **Combating Invasive Pathogens that Threaten Specialty Crop Markets, Project 18**

Project Summary: The goal of this project was to enhance the capability of the Pennsylvania Department of Agriculture (PDA) to detect and manage high-risk pathogens, especially exotic pathogens, so that the production and marketing of specialty crops is adequately protected. Our accomplishments in 2011 are summarized below and should demonstrate that we went beyond the proposed goal.

Project Approach:

1. Pathogens detected in the samples submitted to PDA
We have analyzed samples submitted to PDA diagnostic laboratory mostly by PDA plant inspectors and Penn State Extension specialists. These samples came from plant inspection, certification, survey, extension services, or regulatory actions. As of November 2011, we have detected 479 pathogens on 1,063 samples. The percentages of biotic and abiotic diseases on 279 different hosts were 45.3% and 56.7%, respectively. In all sampling locations, fungal pathogens were most commonly isolated (Table 1). Most frequently encountered diseases and their causal agents are summarized in Table 2.

Table 1. Pattern of pathogen distribution among the samples submitted to PDA

Sampling	Pest distribution (%)

Location	(Based on samples largely collected by PDA plant inspectors)					
	Bacteria	Fungus	Virus	Nematode	Insect	TOTAL
Greenhouse	3.4	10.8	4.1	0.1	0.4	**18.9**
Nursery	0.5	11.7	0.4	0.1	8.2	**20.9**
Garden Center	0.8	3.9	0.2	0.1	0.7	**5.6**
Field	0.9	3.2	0.1	0.0	0.3	**4.4**
Residence	0.4	1.2	0.1	0.0	1.1	**2.8**
Other	0.7	2.1	0.6	0.0	0.8	**4.1**
TOTAL	**6.6**	**32.9**	**5.5**	**0.3**	**11.4**	**56.7**

Table 2. Most frequently encountered diseases and their causal agents

Pathogens	Number of samples											
	Tomato	Spruce, blue	Chrysanthemum	Begonia	Million bells	Douglas-fir	Geranium, zonal	Poinsettia	Petunias	Pine, Austrian	Spruce, serbian	Total
Xanthomonas begoniae				22								22
Chrysomyxa weirii		14									4	18
Thielaviopsis basicola					15							15
Botrytis cinerea	2		1	3	1		4	2	1			14
Diplodia pinea		2				7				1		10
Puccinia horiana			10									10
Pythium sp	1		3		2		3					9
Phaeocryptopus Gaeumanni						7						7
Dothistroma pini										6		6
Fusarium sp.			4		1				1			6
Xanthomonas vesicatoria group	6											6
Other	55	37	36	35	34	29	17	12	10	10	10	335

2. Bacterial spot of tomato and pepper

This disease is caused by several Xanthomonas species, has been a chronic problem in Pennsylvania, and is often associated with tomato transplants shipped from other states. In 2011, a total of 6.2 million tomato

transplants were inspected and sampled in nine different PA counties. To help identify the likely sources of pathogen introduction to state's tomato production systems, additional samples were collected from greenhouses, fields, and home gardens by PDA plant inspectors and vegetable specialists of Pennsylvania and Virginia Cooperative Extension programs. Each sample was potted, gently rubbed with sterile wet cheesecloth, and incubated in a mist chamber for the symptom development. Xanthomonas isolates from symptomatic lesions were characterized using pathogenicity on tomato (ten cultivars of processing tomatoes) and pepper (two cultivars), carbohydrate utilization (five carbon sources), amylolytic and pectolytic activities, xanthomonadin production on sucrose peptone agar (SPA) and yeast dextrose agar (YDC), copper sensitivity, and Xanthomonas-species specific PCR. The number of symptomatic tomato and pepper samples totaled 55 from which 15 Xanthomonas isolates were isolated. Only X. perforans and X. gardneri were detected in PA. Tomato samples submitted by VA were infected with X. perforans, which is the first occurrence record in VA. Koch's postulate study indicated that X. gardneri was pathogenic to both tomato (cvs. Bonnie Best, Walter, 3402, Mountain Fresh, Mariana Plum, TSH 24, 611, 9997, 9704 and 4007) and pepper (cv. Niagra) plants. On the other hand, X. perforans was pathogenic only to tomato plants. One of the VA X. perforans isolates was pathogenic to pepper var. Niagra (not Cal Wonder), which requires further confirmation. Isolates of X. perforans are often sensitive to copper, but X. gardneri isolates (newly emerging pathogen – known to occur only in PA. OH, and MI in the US) are sensitive to copper. The copper sensitivity of all isolates from this year's survey will be tested.

Various polymerase Chain Reaction (PCR)-based molecular diagnostic methods were evaluated for detection of bacterial spot of tomato and pepper. In addition to evaluating the specificity and sensitivity of recently published PCR primers for detecting Xanthomonas species with previously isolated strains in PA as testers, newly designed primers and probes for several loci (gyrB, lacF, lepA, fusA, gapA, gltA, rpoD, dnaK, fyuA) were evaluated as potential targets for detection and differentiation of X. gardneri, X. perforans, X. euvesicatoria, and X. vesicatoria. In all, 32 pairs of primers and probes were designed to develop species-specific real-time PCR for detection of X. gardneri and X. perforans, which are predominant in PA. This work is in progress.

3. Tomato bacterial canker caused by Clavibacter michiganensis ssp. michiganensis

In PA, this disease has been a chronic problem and causes a serious crop loss in greenhouses, high tunnels and fields. Contaminated seeds usually give rise to apparently healthy seedlings, which makes it hard for plant inspectors and diagnosticians to detect the diseases on tomato transplants. The disease symptoms become apparent when the infected plants approach maturity. In 2011, this pathogen was isolated from spots on tomato leaves. The bacteria cause "bird's eye symptoms" on fruit but not leaf spots , which needs further investigation.

4. The first report of Geosmithia morbia (Thousand canker disease) in PA

On July 29, 2011, Penn State Plant Disease Clinic received a suspect sample from Bucks County, PA. PDA and USDA confirmed the presence of both the walnut twig beetle and Geosmithia morbia in Bucks County. A quarantine order was issued on Aug. 10, 2011 to stop the movement of all walnut material and all firewood from Bucks County outward. An intensive survey for the disease will likely happen in 2012.

5. Chrysanthemum white rust (Puccinia horiana – Federally regulated pathogen)

This disease was detected at 10 different sites, including nurseries, greenhouses, garden centers, and residences, in seven PA counties (ranging in planting size from 12 to 3000 plants in June – October). The trace-back investigations indicated that the inoculum sources were all from the mum plants held over from the 2010 winter. Infected plants were all destroyed under the supervision of PDA plant inspectors. Our data showing the survival of pathogen over winter in PA and the challenges it poses to disease management were published (see General Distribution List of Publications).

	6. Isolation of Phytophthora We have isolated 328 Phytophthora cultures from the samples submitted to PDA for the detection of P. ramorum. The cultures were stored and the sequence data of the cultures will be archived in the public database (www.Phytophthoradb.org) hosted by Penn State.
Goals and Outcomes Achieved:	Specific examples of benefits include: 1. Early detection and accurate identification of potentially highly destructive pathogens enable rapid deployment of regulatory and/or management actions, which will lead to eradication of such pathogens at affected sites, implementation of appropriate disease control measures, and/or prevention of further spread. • In 2010, we reported the first occurrence of X. gardneri in PA and the U.S. (Plant Disease. 94:638). We informed Dr. Sally Miller, a vegetable specialist in OSU, that we isolated X. gardneri type strain xcgA2 in PA in 1995 from a OH hybrid tomato, OX 88. As a result, OH and MI detected X. gardneri in their states (Plant Disease. 95:1584. 2011). • Due to detection inconsistencies of bacterial fasciation (caused by Rhodococcus fascians), a regulatory action, "Stop Sale," has not been effectively implemented over the years. Our research on the development of an accurate and rapid detection method based on real time PCR contributed to the PDA certification and inspection programs. With this method, we have identified the major problem propagators and sources of the inocum, and that the occurrence of bacterial fasciation has declined drastically in recent years in PA. This method has been accepted for publication by the Plant Management Network (see **General Distribution List of Publications**). 2. A database that contains genotypic and phenotypic data from pathogen collections analyzed through this project will serve PDA in a way similar to what the forensic DNA database does for the federal and state law enforcement agencies. It will permit a rapid risk assessment of a newly isolated pathogen and will also assist in recognizing patterns of pathogen movement/change. Especially, the data derived from various Phytophthora species archived at PDA contributed to establishing a very comprehensive database for the whole genus (http://www.phytophthoradb.org/). This database now has more than 500 registered users from 50 different countries and has facilitated the identification and description of new species. The sequence data have also helped us develop and validate new molecular diagnostic tools. Typically, several hundred people per month visit the database.
Beneficiaries:	The project's primary beneficiaries are Pennsylvania's specialty crop industry and individual growers. The knowledge and data resulted from this project have also benefited PDA by supporting its mission of safeguarding the economic security and sustainability of agriculture in the state.
Lessons Learned:	As observed in previous years, many pathogens detected this year are associated with propagation materials that are in transit such as seeds, transplants, rooted cuttings, or container-grown plants, highlighting the importance of monitoring plant materials imported to the state. **1. *Phytophthora ramorum* detection from Rhododendron leaf baits, PCR vs Isolation** • An alternative new method or approach is needed for efficient isolation of *P. ramorum*. Our data clearly indicates that Rhododendron leaf baits trap many *Phytophthora* species from water, but commonly fail to trap *P. ramorum*. Soil and water samples resulting in *P. ramorum* RCR positive were often isolation negative. • Our preliminary data analysis indicates that leaf baits collected during early Spring are more *P. ramorum* positive than those collected during other seasons. 2. We need to continuously monitor the nature and changing profiles of pathogens introduced to the state. It is also critical to archive the genotypes and phenotypes of previously characterized pathogen isolates in an easily accessible manner so that these reference data can provide a critical insight into how pathogen communities

	are structured and have changed in the state. As summarized above, this project builds on the long-term partnership with PDA, and we plan to continue this collaboration with the following three objectives so that the production and marketing of specialty crops is adequately protected from the targeted pathogens. • To determine the geospatial distribution pattern of *Xanthomonas* species that cause bacterial spot of tomato and pepper and evaluate the degree of copper tolerance among pathogen populations • To optimize diagnostic PCR protocols to support early detection of *Puccinia horiana* • To identity *Phytophthora* isolates collected from ornamental plants
Contact Person:	Seogchan Kang, Professor, Department of Plant Pathology Penn State University Telephone: 814-863-3846 E-mail: sxk55@psu.edu
Additional Information:	**General Distribution List of Publications:** 1. Nikolaeva, E. V., S. Kang, T. N. Olson, and Kim, S. H. 2011. Real-time PCR detection of *Rhodococcus fascians* and discovery of potential new host plants for *R. fascians* in Pennsylvania. Plant Management Network. Plant Health Progress *in press*. 2. Kim, S. H., E. V. Nikolaeva, t. N. Olson, and S. Kang. 2011. Overwintering of Chrysanthemum white rust caused by *Puccinia horiana* in Pennsylvania and challenges in its management. Phytopathology 101: S91 (Abstract). **Communications:** In 2011, PDA plant inspectors were trained on: • How to inspect plants. • Updates on *Phytophthora ramorum* • A new occurrence of *Geosmithia morbida* in PA. **List of All Personnel Associated with the Project and Their Roles:** 1. Project participants Dr. Seogchan Kang, Professor of Plant Pathology at Penn State Dr. Seong H. Kim, Adjunct Professor of Plant Pathology at Penn State and Plant Pathologist Supervisor at PDA Tracey N. Olson, Plant Pathologist at PDA Dr. Ekaterina Nikolaeva, Research Associate at Penn State Dr. Hyeseon Kim, Postdoctoral Fellow at Penn State Bongsoo Park, PhD candidate at Penn State 2. Roles of individual participants Kang and S. Kim designed the experiments, supervised other participants and prepared the report. Olson conducted bacterial pathogen isolation and identification. Nikolaeva ran all molecular diagnostic assays and developed new PCR-based diagnostic tools described here. Kim, H. contributed to identifying Phytophthora. Park curated Phytophthora Database.
Project Title:	**Controlling Tomato Diseases; Organic and Sustainably Produced Tomatoes, Project 20**
Project Summary:	Seven disease control treatments were applied to two varieties of commercially grown tomatoes. Each treatment block consisted of 5 each Scarlet Red cv. and 5 each Primo Red cv. plants with a yellow fruiting type between to facilitate harvest differentiation. Each treatment was repeated 4 times using a randomized block

	design. This project built upon previous work conducted in an earlier grant. The previous grant was focused on gaining information to encourage growers to consider alternative products. This grant focused on the production quality of the products applied. The vegetable growers were having difficulty with strains of bacillus subtillus and knowing what product to apply and how often in a sustainable method. The need for this project was to assist growers with choosing the best product to treat pathogens, while minimizing application costs. With the local movement trend continuing to be strong, the demand for sustainably and organic produced tomatoes has increased.
Project Approach:	Disease control treatments: 6) Water: This was our control to provide a benchmark for general levels of local disease pressure. 7) Grower Standard / Conventional (Chorothalonil + Copper alternated with Chlorothalonil + Tanos): This is a good conventional grower standard fungicide treatment which we used to compare our biological / biorational control against. 8) Copper: For many organic growers, this is the primary fungicide / bactericide. 9) Vermicompost Tea: The Fertrell Company, Elizabethtown, PA supplies many local growers with the active cultures for this product. Fertrell's technical staff supported and trained us in the production and application of this product which is used by many Amish and Mennonite producers in the Lancaster Area. 10) Regalia alternated with Copper: Regalia is an extract of Giant Knotweed that has been shown to activate several of the plants pathways that help to prevent disease. Copper was included based on research from Cornell that indicated the need to bolster the bactericidal control. 11) Actinovate alternated with Copper: Actinovate is a Streptomyces product that is commercially sold as a biological disease control. Copper was included as in #5. 12) Stimplex alternated with Copper: Stimplex is a seaweed extract that has been shown to activate several of the plant pathways to prevent disease as well as hormone-like effect that stimulates plant growth. Copper was included as in #5. 13) Grower Standard / Conventional (Chorothalonil + Copper alternated with Chlorothalonil + Tanos): This is a good conventional grower standard fungicide treatment which we used to compare our biological / biorational control against. 14) Copper: For many organic growers, this is the primary fungicide / bactericide. 15) Vermicompost Tea: The Fertrell Company, Elizabethtown, PA supplies many local growers with the active cultures for this product. Fertrell's technical staff supported and trained us in the production and application of this product which is used by many Amish and Mennonite producers in the Lancaster Area. 16) Regalia alternated with Copper: Regalia is an extract of Giant Knotweed that has been shown to activate several of the plants pathways that help to prevent disease. Copper was included based on research from Cornell that indicated the need to bolster the bactericidal control. 17) Actinovate alternated with Copper: Actinovate is a Streptomyces product that is commercially sold as a biological disease control. Copper was included as in #5. 18) Stimplex alternated with Copper: Stimplex is a seaweed extract that has been shown to activate several of the plant pathways to prevent disease as well as hormone-like effect that stimulates plant growth. Copper was included as in #5. The planting was installed in early June at the Penn State Southeast Research and Extension Center(SEAREC). Disease control treatments began 4 weeks later. The first harvest was on 8/11/11 and harvests continued until 9/1/11.
Goals and Outcomes Achieved:	The fungicide treatments did not have a significant effect on total marketable yield or on the number or weight of grade 1 or grade 2 tomatoes. Variety did have a significant effect on total marketable yield. Variety P had a significantly higher total number and weight of fruit. Foliar disease ratings were only taken on 1 date and

	percent defoliation ranged between 24.4% and 83.1% across the fungicide treatments. The grower standard program, copper and regalia programs significantly reduced the percent defoliation however defoliation did not have an effect on total marketable yield. Due to the nearly complete infection of the trial with Bacterial canker, the results are a little difficult to analyze. This disease is the single greatest challenge to Mid-Atlantic growers even when compared to Late blight as there are no effective controls once a plant is infected. Since the harvest was interrupted due to the 2 tropical storms that flooded the field and prevented application of disease treatments, marketable yields cannot be used to evaluate the results. Per the attached table "Tomato Fungicide Trial 2011", there are significant differences in both foliar disease rating and % defoliation scores. The grower standard program based around the fungicide chlorothalonil plus copper, copper alone, and the Regalia (Giant Knotweed extract) plus copper program all appear to be superior programs in preventing foliar diseases as compared to other program treatments.
Beneficiaries:	Pennsylvania Vegetable Growers and farm marketers who sell tomatoes benefited from this knowledge. The growers are applying label to product at more appropriate rates, controlling disease better and have reduced unnecessary application of more harmful products. Initial project results were shared with 107 growers, crop consultants, suppliers and fellow researchers at the Pennsylvania Vegetable Growers Association Field Day at PSU SEAREC on August 3, 2011.
Lessons Learned:	The single greatest challenge to the project this season was the extremely hot and dry weather followed by back-to-back tropical storms in September which ended harvests as the tomato plants collapsed due to flooding conditions. While the low humidity in the early summer limited fungal disease development, the extreme heat again encouraged the development of Bacterial canker as it did in 2010 throughout the trial. This turned to be useful as there was substantial differentiation between the treatments in controlling or slowing the development of Bacterial canker. Since this was significant differences in defoliation due to disease pressure, the early end to harvests due to the heavy rains substantially limited the potential for yield differentiation between treatments.
Contact Person:	Steve Bogash, Regional Horticulture Educator Penn State Extension, Franklin County, 181 Franklin Farm Lane Chambersburg, PA 17202, 717-263-9226 ext 230 Email: smb13@psu.edu, Web: extension.psu.edu
Project Title:	**Microbial Survey of Pennsylvania Surface Water used for Specialty Crop Irrigation and Development of Sampling and Handling Procedures for Surface Water Testing, Project 22**
Project Summary:	The purpose of this project was to continue evaluating microbial food safety risks associated with the use of surface water intended for irrigation of specialty crops in Pennsylvania and to develop and validate the accuracy of a simple economical procedure farmers can use to submit samples to offsite water testing laboratories. This project is a continuation of a multi-year project entitled "Microbial Survey of Pennsylvania Surface Water used for Specialty Crop Irrigation and Development of Sampling, Handling, and Shipping Procedures for Surface Water Testing" in which, a broad survey was conducted which yielded valuable information that has increased grower awareness on farm food safety issues. The ultimate goal is to develop and validate a simple, economical procedure farmers can use to submit samples to remote water testing laboratories. The purpose of the project described in this report FY2010 was to continue and replicate and earlier project of the same name from FY2009 that evaluated microbial food safety risks associated with the use of surface water intended for irrigation of specialty crops in Pennsylvania and to develop and validate the accuracy of a

	simple, economical procedure farmers can use to submit samples to offsite water testing laboratories. The previously submitted final report for FY2009 is included in the Appendix at the end of this report for reference.
Project Approach:	(October 1, 2010 – September 30, 2011) **Background:** Activities performed this year continue those in the 2009-2010 project, "Microbial Survey of Pennsylvania Surface Water used for Specialty Crop Irrigation and Development of Sampling, Handling, and Shipping Procedures for Surface Water Testing" (ME 44091393). For the previous project, irrigation water used for irrigation was sampled from 33 farms in an area, roughly bounded by Interstate highway 80 and the southern border of the state, and by the Susquehanna River and the eastern border of the state. Results from that study showed wide variation in microbial indicator microorganisms (aerobic plate count, fecal coliforms, coliforms, Enterobacteriaceae, Enterococci, generic E. coli) although no human pathogens were detected in any samples that year. Nevertheless, high populations from indicator organisms suggested that growers who evaluate the microbial safety of their irrigation based on current irrigation water standards water are at risk of noncompliance despite the absence of detectable levels of disease causing microorganism. Results from that year therefore yielded valuable information that has increased grower awareness on farm food safety issues. **Summary:** (A timeline is presented to compare the work plan with actual accomplishments in Table 1) Starting in October 2010, the graduate student worked with the Penn State College of Agriculture statistical consulting service to compile and statistically evaluate the data from the first survey conducting during the previous summer. The results from that survey were considered preliminary since they represent only one year of data. However, we found that 45% of the samples would have failed the often referenced EPA recreational water standards of 126 CFU/ 100 ml. No pathogens were found in the summer of 2010. Therefore, our methodologies for E. coli O157:H7 and Salmonella spp. were modified during October through February 2010. The student conducted a literature review of alternative methods and selected and modified them to include a selective enrichment step. The new methods, to be used in the 2011 season, were validated by conducting laboratory pathogen inoculation studies using surface water samples with high populations of harmless background microflora. The new methods proved superior to the method used earlier, although we sacrificed actual population counts for a simple determination of absence or presence of pathogens. Some suspect isolates from the 2010 survey were tested with this new method and were confirmed negative for pathogens. Molecular Polymerase Chain Reaction (PCR) methods were also developed, and suspect pathogen isolates were also confirmed negative by this method. From January through April 2011, the our preliminary results were communicated to growers through a series of one-day winter workshops titled "Keeping Fresh Produce Safe Using Good Agricultural Practices (GAPs) held in Altoona, Dupont, Greensburg, Lancaster, Leesport, Mifflinburg, and North East, Pennsylvania. Across the eight 6-hour workshops, 219 individuals attended. Included in the 8 module curriculum was a 50-minute presentation entitled "Safety of Water". Topics in the presentation included sources of agricultural water and potential contaminants, the importance of inspecting and maintaining wells, lower and higher risk methods for irrigating crops using surface water, microbiological testing methods, the concept of indicator microorganism vs. actual pathogens, microbial water standards applicable to irrigation water, and preliminary results from the 2010 microbial survey of Pennsylvania surface waters. Photographs of surface water sources taken during the 2010 survey were incorporated into the module to facilitate discussion of risk factors that can affect microbial quality of water. Pre and posttest evaluation data were collected for the workshop and participants' knowledge of GAP issues before and after the workshop were tested. With respect to the topic of microbial safety of water, participants were asked to determine the correctness of two statements before and after the workshop, 1) "USDA standards require that pond water used for irrigation be tested for microbes at least 3 times during the growing season" and 2) "Drip irrigation methods are more likely to cause crop contamination than

overhead spraying". For question 1, 64% of the 166 respondents answered the question correctly (true). This number increased to 96% after the workshop. For question 2, 97% answered the question correctly (false) both before and after the workshop. These results show that growers came to the workshop with good knowledge of benefits of drip irrigation but were less knowledgeable about USDA surface water testing requirements.

Also, in February of 2011, results from the 2010 season were presented at the 2011 Mid-Atlantic Fruit and Vegetable Convention in Hershey, Pennsylvania. The lecture titled "Penn State GAPs Program" was presented on February 2 as part of the ½ day Food Safety session to 90 participants from Pennsylvania and surrounding states. No evaluation was conducted. Question and answer sessions after the session provided a valuable forum to communicate the issues around the safe use of irrigation water from surface waters.

In April of 2011, GAP basics, including the data generated during the 2010 season were presented to Horticulture undergraduate students attending a Junior Seminar class (Hort 390). The lecture, titled "Fresh Produce Food Safety and Good Agricultural Practices", and follow-up discussion were presented by the graduate student conducting the research. This forum provided information on farm food safety that the students might not have otherwise obtained through their horticulture curriculum.

From June through August 2011, sampling took place at 30 farms. Slightly fewer farms were sampled in 2011 compared to the previous year because some surface water sites had dried up, while some new sites were found to replace some of them. Samples were taken three times at each site (June, July, and August) through the growing season and analyzed at the Penn State Berks campus for indicator microorganisms (aerobic plate count, fecal coliforms, coliforms, Enterobacteriaceae, Enterococci, generic E. coli) and human pathogens (E. coli O157:H7 and Salmonella spp.). Pathogen detection was focused on these two most-implicated pathogens in produce related outbreaks because it was not logistically feasible to test for Shigella and Yersinia, as originally planned, using the new methods. Physical tests in 2011 were the same as the previous year and included pH, conductivity, air and water temperature, turbidity, and dissolved oxygen. Data was also collected on grower practices and environmental factors (upstream water use, nearby animal activity, water flow, precipitation levels three days prior to sampling) that may affect the potential for water contamination.

Also conducted from June through August 2011, was a project to determine the range of temperatures that might be encountered during mailing samples to a remote laboratory site. Water samples were collected in Wyomissing, Pennsylvania at three different times during the summer. A temperature data logger was placed into the each water sample and samples were packaged and mailed via U.S. Postal Service to the Food Science Department on the Penn State main campus (University Park, PA), an approximate distance of 150 miles. In general we observed that sample temperatures closely followed ambient air temperatures determined from meteorological records. All samples reached equilibrium with ambient temperatures within 30 hours. The maximum temperature reached among all samples was 39°C (102oF). A single flexible gel coolant blanket and basic cardboard box did not provide a sufficient cooling effect to lower sample temperatures below ambient temperatures. These results will be used in for next year's laboratory experiments to determine microbial population changes in mailed surface water samples and to further evaluate packaging materials for their ability to keep samples cool and prevent changes in microbial populations.

In September of 2011, analysis of the entire data set began, although statistical results were not completed by October 1, 2011 (Updates on statistical analysis of results of 2010 and 2011 survey to be presented in FY2012 12-25-B-1251, 2012-2013 final report).

Goals and Outcomes Achieved:

Proposed objectives	Achievements

	1) Analysis of 2010 growing season data.	We completed a preliminary statistical evaluation of the 2010 growing season data. A final analysis will require 2011 growing season data.
	2) Develop and validate sampling, handling, and shipping procedures for accurate microbial enumeration of water samples.	We began this study in the summer of 2011 by collecting data on temperature ranges expected during mailing.
	3) Disseminate our results for Pennsylvania growers	We presented our results to growers through a series of 2011 GAP workshops and at the Mid-Atlantic Fruit and Vegetable Convention.
Beneficiaries:	The number of beneficiaries can be based on growers we have trained to date and which we expect to require continued specialized training, advice, and coaching as they develop farm food safety plans. In 2009 (video conference to 11 sites) and 2011 (face to face at 8 sites) we trained 400 and 219 individuals, respectively. In 2012, we trained 540 individuals, approximately half of which were Amish/Mennonite produce growers. Our records show little overlap each year with respect to attendees. We continue to receive requests for basic and more topic specific training and expect this number to further increase. More generally, we believe that the results of this study will benefit growers throughout the U.S. The data we have collected is confirmed by other studies and provides evidence to government and private auditors that the recommendation to use microbial indicators to predict the safety of irrigation water is not based on scientific evidence and that many growers will fail to meet irrigation water standards despite absence of pathogens. It is hoped that this will spur the development of rapid, inexpensive methods for testing of actual pathogens and more focused efforts on methods for water decontamination.	
Lessons Learned:	Because we failed to find any pathogens during the 2010 season, we did not need to assess antibiotic resistance of pathogens, but we needed extra time to develop a more sensitive method for pathogen detection. We adjusted our analytical methods and used them during the 2011 survey. Our initial tests to determine the range of temperatures that may occur during USPS mailing told us that a simple ice pack was not sufficient to keep temperatures below ambient (up to 102oF). Thus we need to improve our packaging design (Updates on packaging study and statistical analysis of results of 2010 and 2011 survey to be presented in FY2011 12-25-B-1251, 2012-2013 final report).	
Contact Person:	Pennsylvania State University Luke LaBorde 202 Food Science Building, University Park, PA 16802 Phone: 814-863-2298 E-mail: lfl5@psu.edu	

Additional Information:

Table 1. Project activities proposed in the grant application and actual achievements conducted during the period of the grant.

Project Activity		
Proposed		**Actual**
Project Activity	**Month**	**Activity**
Compile and evaluate data collected in the summer of 2010	Oct 2010 – Dec 2010	Compilation and statistical evaluation of the data from the previous summer
Confirm identity of pathogens found during the survey using serological and molecular typing methods. Determine antibiotic resistance of pathogen isolates.	Oct 2010 – Dec 2010	No pathogens were found in the summer of 2010. Therefore this time was spent on developing a more sensitive method that included an enrichment step designed to detect very small populations of pathogens. Molecular PCR methods were developed to confirm any suspect pathogens. Both methods confirmed that no pathogens were found during the summer of 2010.
Conduct laboratory validation studies to determine optimal storage conditions for test mailing kits.	Nov 2010 – May 2011	Work began to prepare prototypes of packages used for shipping surface water samples. Actual study occurred during summer (see below).
Report results to date at 2011 Mid-Atlantic Fruit and Vegetable Convention, fall/winter grower meetings, and GAP training workshops.	Nov 2010 – March 2011	Results from the 2010 season were presented at the February 2, 2011 Mid-Atlantic Fruit and Vegetable Convention in Hershey, Pennsylvania.
Retest selected sites for confirmation of the presence of pathogens. Develop mail-in kit and conduct a pilot test of the program with the Penn State Analytical Laboratory	May 2011 – Sep 2011	Since no pathogens were found in 2010, there was no re-testing of sites, the microbial survey was repeated. Work started on developing and validating a mail-in kit by conducting a temperature profile study of samples sent through USPS mail.

APPENDIX

Final report for

Microbial Survey of Pennsylvania Surface Water used for Specialty Crop Irrigation and Development of Sampling, Handling, and Shipping Procedures for Surface Water Testing

2009-2010

Microbial Survey of Pennsylvania Surface Water used for Specialty Crop Irrigation and Development of Sampling, Handling, and Shipping Procedures for Surface Water Testing

2009-2010 Final Report

The Pennsylvania State University
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PROJECT SUMMARY

Several recent foodborne disease outbreaks have been attributed to on-farm microbial contamination of fresh fruits and vegetables. National and regional grocery stores have reacted by requiring their produce suppliers to develop farm food safety plans and submit to third party farm audits and increased government oversight can be expected. Comments received during and after a March 2009 Penn State farm food safety workshop indicated a need to increase our understanding of microbial populations in Pennsylvania surface water used for irrigation. The purpose of this project was therefore to assess risks associated with irrigation water by conducting a microbial survey of Pennsylvania surface water sources used on Pennsylvania produce farms.

PROJECT APPROACH

Pennsylvania growers who use surface water for irrigating produce crops were identified from a follow-up survey to previous Good Agricultural Practices cooperative extension workshops. In order to be relevant to the beneficiaries of this research, attempts were made to following the water sampling protocol outlined by the USDA voluntary audit protocols which it was believed will be enforced on many of these growers in the near future. These protocols include sampling 3 times throughout the growing season, and analysis of water samples within 6 hours of the collection of the water sample. The choice of farmers to contact for participation in this program was based on calculated driving times from the analytical laboratory necessary to limit the interval between sampling and analysis to no more than 6 hours. Of the growers contacted, permission was granted from 33 produce growers in the south and south central region of Pennsylvania allowing us to survey their surface water sites three times during the summer of 2010. This sample size provided a much greater breadth of samples than in many previous surface water surveys found in our review of the literature.

A set of standard operating procedures was developed which outlined project protocols for sample collection, microbial methods, recording observations, and data collection to standardized methods between all researchers involved. Water samples were collected at each site 3 times throughout the growing season. Each sample was tested for a number of pathogenic and non-pathogenic microorganisms as well as characteristics of the farm and water source, which are outlined in Figure 1. Non-pathogenic organisms were chosen to represent the organisms which are currently used to set standards for microbial testing, and pathogenic bacteria were chosen as the most likely bacteria to cause produce-related outbreaks. Microbial and physical analysis was conducted by the graduate student funded in this project with the assistance of an undergraduate food science student at the Penn State Berks campus.

Results shown in Fig. 1 indicate widely varying levels of microbial indicators in Pennsylvania surface water used for irrigation of fresh produce crops in 2010. Sixty seven (67) percent of the samples taken exceed the fecal coliform limit of 200 CFU/100 ml established in the Pennsylvania recreational water standards. If samples were evaluated against California leafy greens standards for generic *E. coli* in irrigation water, 57% would be in violation (Fig. 2). The widespread occurrence of *E. coli* is of concern since it is an indicator of fecal contamination, and thus may indicate the potential for the presence of human pathogens. Initial testing for human pathogens yielded many false positives that led us to re-evaluate our microbial methods to be used in the 2011 survey. These preliminary results, however, do show that that many of the water sources were accessible to domestic and wild animals and that some were from low-flow streams or still ponds, factors which might be linked to higher microbial populations. This survey must be replicated in the 2011 growing season for a more definitive analysis.

Statistics were run to determine correlations between any of the indicator organisms and characteristics of the water sources. Significant correlations were found between the temperature of the water source and the conductivity and the level of both fecal coliform and coliform in the sample. pH was seen to have the most consistent correlation to microbial levels, showing a correlation to all indicators except e. coli. To ensure that these trends are valid across a wider range of water sources, this survey will be replicated in the 2011 growing season.

GOALS AND OUTCOMES ACHIEVED

Each of our goals was achieved. Goals for year 1 of this project and actions taken to achieve each goal are summarized.

Goal	Activities to meet goal
1) Contact growers and extension educators through letters and off-season GAP training sessions including food safety session at 2010 Mid-Atlantic Fruit and Vegetable Convention.	Presentations on farm food safety standards were presented at extension grower meetings and at the February 2010 Mid-Atlantic Fruit and Vegetable Convention in Hershey, PA. Extension educators were trained on GAPs through a farm food safety In-service webinar held in May of 2010. Growers known to irrigate with surface water were contacted and asked to participate in the microbial survey to be conducted in 2010 growing season.
2) Conduct a literature review on food safety issues related to irrigation water.	A literature survey on existing recommendations or audit standards for allowable levels of microorganisms in irrigation was conducted.
3) Develop sampling and microbial enumeration techniques and protocols for collecting site location and environment data.	Known methods for chemical, physical, and microbial analysis of water were collected and materials and instruments for obtaining data were purchased.
4) Begin sampling during the 2010 growing season.	Sampling began in June of 2010 and continued through August. Water samples were collected and tested for microbiological organisms and physical characteristics at 33 farms between June and August of 2010.
5) Deliver information that growers can use to comply with farm food safety standards.	Individual grower results were mailed to each participant in September 2010.

BENEFICIARIES

Produce growers who participated in this project were the immediate beneficiaries of this project. After the survey was completed, each grower was mailed the results of the microbial survey for their farm or orchard. An individualized letter was attached that explained how their results compared to existing irrigation water standards or recommendations. Anonymous results were included in the "Safety of Water" module within the "Keeping Fresh Produce Safe" GAP training workshops presented January through March of 2011. The larger population of growers in the Mid-Atlantic region benefited through presentations at extension winter grower meetings and the Mid-Atlantic Fruit and Vegetable Convention in Hershey, PA. Extension educators gained awareness of GAP water safety issues by participating in a Farm Food Safety In-service Webinar held in May of 2010. Although the high failure rate for meeting water quality standards is a concern to growers, they will ultimately benefit if, through identification of a potential food safety risk, we focus our

future work on finding practical methods to lower indicator microorganism levels in the future. As this is only the first year of a multi-year research effort, the potential economic impact of this project cannot be fully assessed. We anticipate though that by presenting preliminary results to growers, we have raised awareness of the need for them to start documenting microbial levels in surface water sources used to irrigate fresh produce. By doing so, time and resource burdens placed on growers as a result of the inevitable transition to stricter farm food safety will be lightened.

LESSONS LEARNED

A broad survey such as conducted in this project yielded valuable information that has increased grower awareness on farm food safety issues. From these preliminary results, we learned that many growers will find it difficult to meet established microbial water standards for crop contact irrigation water. Despite high levels of coliforms, fecal coliforms, and *E. coli*, we could not confirm the presence of human pathogens in any samples using standard microbial plating techniques. A correlation between microbial indicators and pathogens cannot therefore be made at this time. Thus it appears that many growers will fail to meet these standards despite actual evidence of human pathogens. These standards will no doubt continue to be used until technological advances are made that will permit rapid, accurate, and low cost testing for actual human pathogens. In the meantime, given the increasing scrutiny of regulators and commercial buyers on farm food safety, and in particular the potential for water contamination of crops, we feel that additional research may be necessary to explore cost effective ways for growers to reduce indicator microbial levels prior to irrigation.

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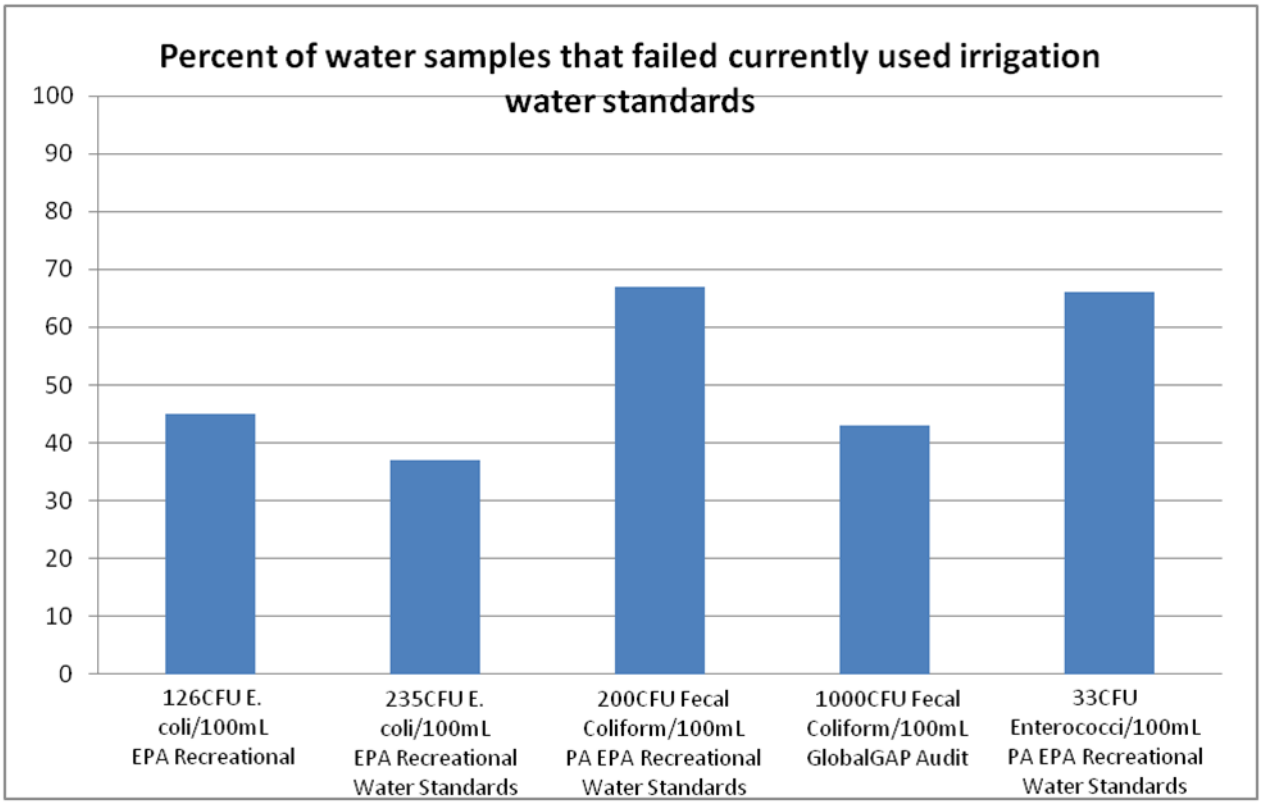
Table 1. Types of data collected at each sampling site.

Microorganisms	Physical characteristics	Observations
Microbial indicators	**pH**	**GPS Coordinates**
Generic E. coli	**Air temperature**	**Farm Size**
Coliforms	**Water temperature**	**Crops grown/irrigated**
Fecal Coliforms	**Turbidity**	**Type of water source**
Enterococci	**Conductivity**	**Upstream use**
Enterobacteriaceae	**Dissolved oxygen**	**Depth at intake**
Human pathogens		**Precipitation previous 72 h**
***E. coli* O157:H7**		**Water movement**
Yersinia enterocolitica		**Algae growth**
***Salmonella* spp.**		**Nearby animal activity**
Shigella		

Figure 1. Populations of microbial indicator organisms

Figure 2. Percent of water samples that failed currently used irrigation water standards (2010 season)



Project Title:	**Increasing the Quality of Pennsylvania Wines Through the Expansion of the Pennsylvania Wine Quality Initiative (PAWQI), Project 23**
Project Summary:	The PWA sought to improve the quality of Pennsylvania wines through training and testing by the PA Wine Quality Initiative for the wine industry. The objectives of this several year program were to (1) enhance quality of Pennsylvania wines through training and testing through the Pennsylvania Wine Quality Initiative program and (2) provide educational support for the wine industry on wine quality parameters. The Pennsylvania Wine Quality Initiative (PAWQI) was established to train winemakers and industry professionals to identify wine faults, learn preventative practices to minimize the presence of wine faults, and discover remediation techniques of those wines faults so that they could be fixed prior to bottling and retail. Those winemakers that underwent initial training were then encouraged to evaluate other Pennsylvania wines for potential wine faults in an annual Evaluation Session where wines were submitted blindly for sensory evaluation via the PAWQI program. The training and testing provided in the PAQWI has aided in creating a more consistent quality image of Pennsylvania wines. Through the development of the PAQWI, Pennsylvania wines are being promoted as meeting and/or exceeding a minimum quality standard (i.e. defect-free), helping in the promotion of Pennsylvania wines. The PAWQI services were designed to help newer wineries, as well as the established wineries in identifying common wine defects/faults through sensory training. Such training is often essential for quality control purposes in wine production. Furthermore, the ability to identify faults and education on

	prevention and remediation has led to the production of higher quality wines.
Project Approach:	The continuation of the PAWQI program through the 2011-2012 fiscal year is built upon a previously awarded SCBGP grant, which aimed to enhance Pennsylvania winemakers' awareness and understanding of technical wine flaws/faults. This initial grant (that ended in December 2011) trained 30 individuals in wine fault sensory and reached over 70 individuals, indirectly. That number has now reached an additional 15 individuals for the two-day "Level 1" wine defect training program in January 2012 and 30 for the ½ day short course established at the PWA Annual Meeting in March 2012. These numbers exceeded the initial expectations and goals to thoroughly train 6 individuals at each two-day training program on an annual basis. Additionally, quality of the program received an average score of 6.60 (on a 1 to 7 scale; 1 indicating lowest quality and 7 indicating highest quality) by participating individuals in January 2012. This indicates the level of education and quality is exceeding expectations of and relevant to current participants. Through the use of these additional funds, this program has expanded to include a second tier wine quality enhancement series that covers the sensory training, understanding, and manipulation of other wine sensory attributes (i.e. sour, bitter, astringency, sweetness, body/mouthfeel, alcohol content, and aroma/flavor) that are considered additional quality standards beyond minimization of technical wine faults. This "Level 2" series was added by the Penn State Extension Enologist and was taught throughout four key wine-producing regions within the state of Pennsylvania: Westmoreland County, Erie County, Lancaster County, and Wyoming County. The 2012 year marked the release of this program and reached an attendance of 82 individuals and included the hiring of a student aid to provide administrative support (in addition to the Extension Enologist) to assist in preparation and organization of this program. Overall quality of the course, which included evaluations from all four counties, was a 6.36, again, falling on the higher quality mark of the 7-point scale. Additionally, the annual evaluation led by the Extension Enologist and interim program manager, Mario Mazza, contained over 70 submitted wines from award winners via the PWA annual wine competition and those bottled and pre-bottled wines submitted by wineries. The evaluation of wines was conducted by a previously-trained [past Level 1 participants] panel to ensure the quality of those wines awarded were fault free. Wines were given a hedonic and wine fault rating. Information on each wine was then submitted to each participating winery following the close of the Evaluation. Finally, the initiation stages of building a digital "at home" wine defects training kit to introduce all Pennsylvania winemakers to the PAWQI program and its associated workshops, but also serve as an introductory tool to use sensory evaluation for quality considerations at the winery. In these beginning stages, a digital presentation has been designed for use on an HD-TV or home computer/lap top. Flash drives to hold the presentation and video footage were purchased and will be used to build this "at home" training kit.
Goals and Outcomes Achieved:	The Pennsylvania Wine Quality Initiative (PAWQI) has conducted multiple sessions during this grant period. This included a two-day Level 1 wine defect training workshop in which 15 individuals were present, four one-day Level 2 wine sensory attribute training workshops which tallied 82 registrants, and one full-day Evaluation Session where approximately 70 wines were evaluated during May 2012. Additionally, one ½-day short course session was offered at the Pennsylvania Winery Association Annual Conference in March 2012, and held nearly thirty individuals. This session reviewed several of the wine faults that are considered most commonly present in Pennsylvania wines. This workshop served as an introduction to detection, prevention and correction of oxidation and both forms volatile acidity (acetic acid and ethyl acetate). Thirty industry members attended this short course training session, which brings the total number of individuals attending a 2012 PAWQI training session (Level 1, Level 2, or the Short Course) to nearly 127 in addition to previous training years.

	The PAWQI purchased supplies essential to the continuing the sensory evaluation process in more efficient and creative ways. Both original olfactometers (40 wine aromas) previously purchased were fitted for wine sensory aromas that can help aid in panelist training. An additional wine defect olfactometer from Sensory Sciences, LLC was purchased and will continue to be used for rapid panelist training on wine sensory defects. Several vial-based defects kits by Wine Awakenings and Le Nez Du Vin have also been purchased for rapid defect identification while providing on-the-road workshops. Wine Awakenings Kits were also purchased for those individuals that previously participated in the Level 1 series to encourage industry professionals to continuously train themselves. Constant exposure to these defects aids in memory identification of each aroma/flavor. The utilization of several tools contributes to constant and quick panelist training. Using several different mediums also aids in developing panelist memory on wine defects and wine sensory aromas. It is hoped that by enhancing the number of aromas a panelist is exposed to, in addition to providing several types of aromas in various concentrations, many winemakers will be able to improve their wines during production. These exercises should help winemakers retain the identification of wine defects, making it easier to identify them during production when it is essential to apply preventative or remediation techniques to the problematic wines. This mechanism of training has been shown routinely in wine sensory literature. In reviewing the overarching goals identified for the PAWQI, the expected measurable outcomes equaled 15 additionally trained panelists in wine defect identification and 30 of short course trainees within 5 months. For the future of the program we anticipate the need to train 12-24 additional panelists (in wine defects/faults specifically) to ensure the quality and meaningfulness of the program. The long term goal is to train 12-24 attendees annually. Additionally, 56 wines were submitted for sensory evaluation during the timeframe of the grant (October 1, 2011 to September 30, 2012), which is in line with the targeted increase anticipated from past participation. Whilst the solicitation of wines for the sensory evaluation portion of the PAQWI extends beyond the September 30, 2012 deadline, the program organizers will work to see this portion of the program expand and continue to accept and evaluate 70 wines in the coming year, nearly a 25% increase from the previous year. In the long term, the PAWQI would like to attract 60 to 70 of samples annually. Through the use of the Compusense software data can be continually collected to measure the overall improvement of the wines over a longer period of time.
Beneficiaries:	At the beginning of the project there were approximately 130 wineries. Pennsylvania currently has more than 150 wineries. Many new wineries, or those wineries that are in development stages, have had the opportunity to participate in the sensory evaluation classes and learn about wine defects. The greatest benefit of this program is in providing technical, practical, and applicable training and education for those winemakers that may not have had the background prior to opening their winery or becoming a winemaker. Often, participating wineries were able to take their new found knowledge and apply it to their production practices, hence improving their wines that will reach consumers. Additionally, winemakers tend to share their experience with fellow winemakers, which contribute to the progress of the PAWQI program and overall wine quality of Pennsylvania wines. For those people that actively participated in one of the three training programs (i.e. Level 1, Level 2, or the Short Course), the PAWQI program reached 127 individuals directly. This included individuals from about 30% of the various wineries through Pennsylvania. Currently, progression and documentation of the PAWQI program is updated on the "Penn State Extension Enology" website and Facebook page, which reaches a combined total of over 350 industry members in Pennsylvania and the Mid-Atlantic wine region. The effort spurs industry questions, communication, and highlights the program in a positive light to the wineries. Additionally, the Pennsylvania Winery Association

	provides announcements for the PAWQI programming to the wineries in Pennsylvania via their bi-weekly email newsletter that is targeted directly to the wineries. Additionally, funding dollars were spent to distribute post card reminders of the future dates of the program to 200 wineries and winery professionals within the state of Pennsylvania. This initiative included the design and production of a "postcard" that detailed the PAWQI program for the 2013 year. The efforts of this mailing were to reach several wineries by an alternative media for those that are not actively using online resources and recruit more Pennsylvania wineries into the program. The greater the number of individuals that actively participate in the program, the better its influence will be on Pennsylvania wine quality. Results and experiences from the program were also presented at the 2012 VinCo Conference in Colorado via Mario Mazza.
Lessons Learned:	The PAWQI has been able to gain further momentum. At the end of the 2012 season, with further evaluation on reaching more Pennsylvania winery members, resources were used to provide education on wine sensory, wine faults, and wine attributes to a broader audience within Pennsylvania. This objective was not originally feasible at the start of the program, but came about due to the success of the program, especially the Level 2 workshops, in the later 2012 year as well as the incorporation of the Penn State Extension Enologist leading the program. Currently, these funding dollars are being used to create a digital "at home" training kit for all wineries in Pennsylvania that can be viewed on HD-TVs or a home/winery computer. This training exercise could also be used as marketing material for future PAWQI programs. By 2013, the PAWQI "at home" training kit can be utilized by all currently licensed Pennsylvania wineries. In addition to the program's initial goals, an "at home" training kit will increase the opportunity of reaching nearly every winery in the state of Pennsylvania. Although this kit serves as a basic introduction to the Level 1 wine defect/flaw training, it will help improve winemaker and winery personnel (i.e. cellar staff, tasting room state, winery owners, etc.) understanding of wine defects and the terminology associated with this classification of wine sensory. This part of the program will also help improve exposure of the PAWQI among wineries within Pennsylvania and the entire [global] wine industry. It is anticipated that the Level 1 program, in 2013, will reach approximately 24 individuals which is three times its goal of training six to eight people per year. This allows for a greater reach throughout the Commonwealth and its industry personnel. The more people this program can reach, the greater the awareness of wine quality importance. In 2012, the Level 2 program reached 82 wine professionals throughout Pennsylvania and its neighboring states. It is hoped that this part of the program will encourage different participants in 2013, but the approach for the Level 2 program will be altered to include training on "benchmark wines" that receive national and international accolades. It is perceived that the use of these wines will allow winemakers to compare wine styles against, and create a more objective approach on the wine styles produced throughout the state. This emphasizes the point that wine quality goes beyond eliminating wine defects. The ability to properly identify and communicate about various wine attributes (not only defects) will enhance industry member's ability to evaluate and improve wine quality in both individual and cooperative situations. Discussion is ongoing on how to streamline and most effectively utilize the evaluation sessions to maximize wines that can be evaluated in a reasonable amount of time. Key factors involving timing of submissions and how to most effectively convene a trained panel on a more regular basis for sample evaluation. Furthermore,

	efforts are being made to continue to make the program as "mobile" and "internet friendly" as possible to reach a broader audience while continuing training exercises, and increase awareness and opportunity for program participation.
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Project Title:	**Increasing Consumption of PA Specialty Crop Fruits and Vegetables among Urban Youth in the City of Philadelphia Recreation Center Program, Project 24**
Project Summary:	As part of its mission is to ensure that everyone has access to affordable, nutritious food, The Food Trust operates a vibrant network of 30 farmers' markets in southeastern PA, mostly in low-income Philadelphia neighborhoods. The Trust also works with urban youth in more than 90 schools and 40 recreation centers to promote healthy eating and consumption of fruits and vegetables. This project integrated youth nutrition education with increased access to PA-grown produce from our network of city farmers' markets. The Food Trust's team of nutrition educators collaborated with PA farmers and the Philadelphia Department of Recreation to work with urban youth and their families in the city's summer camp and afterschool programs. Project activities included educational field trips for youth to nearby farmers' markets, recreation center-based "Farm Stores" that provided nutrition education and access to fresh PA produce, and cooking workshops for children, families, and other community members, using fresh PA produce from our network of farmers' markets. The project's goals were to expand opportunities for Pennsylvania farmers to sell fresh fruits and vegetables in the inner city, while encouraging consumption of PA produce by low-income urban children and families.
Project Approach:	During the grant period (October 1, 2010 to June 30, 2012), the project conducted multiple activities to provide low-income urban youth with nutrition education while increasing their access to, and appreciation of, PA-grown fresh fruits and vegetables. During the grant period, activities that were focused specifically on the SCBGP-FB priority to increase child and adult nutrition knowledge and consumption of PA specialty crops included: • **Providing nutrition education to youth, with a focus on the benefits of increasing consumption of PA specialty crop fruits and vegetables, such as apples, pears, carrots and salad greens.** During the first year of the grant period, The Food Trust provided twice-monthly nutrition education lessons and related fun games and activities for 500 children in 17 recreation centers each month. The lessons focused on highlighting local foods such as apples, applesauce, and salad greens as healthy snack options. As part of these lessons, students learned that local foods usually taste better than things grown far away because the food doesn't have to travel as far to get here—imparting the knowledge that because PA fruits and vegetables do not travel far to market, they offer optimal flavor, freshness, and nutritional quality for consumers. During the summer of 2011, the Recreation Center Nutrition Education Program theme was *Healthy Food from Around the World and Around the Corner*. Over 700 summer campers learned to cook ethnic foods using PA specialty crop products, including cucumbers and tomatoes (Cucumber and Tomato Salad), local fruits (Fruit Salad) and Salsa Fresca with local tomatoes. Parents also received Philly Food Bucks coupons, which can only be used to purchase fresh local fruits and vegetables from nearby farmers' markets. Lonnie Young Recreation

Center spent a day exploring Solly Brothers Farm in Ivyland, PA, where the youth learned about PA specialty crop fruits and vegetables from their firsthand experiences on this family farm. On the trip, the students each received $5 worth of Farm Bucks to purchase farm-fresh fruits and veggies grown at this PA farm for themselves and their families.

Pennsylvania-grown apples were a highlight of last fall's 2011 Apple Crunch Events, which were held in 8 Philadelphia schools where students had the opportunity to sample three different types of apples. About 5,900 youth participated in the event, sampling 2,350 apples including local varieties, such as Jonamac, MacIntosh, and Golden Delicious. In addition, Food Trust staff members participated in Back to School Nights at 60 schools, where they distributed local apples to promote the importance of eating a balanced breakfast to parents.

This spring (2012), nutrition education activities in recreation centers continued with lessons in 17 recreation centers that emphasized the bounty of Pennsylvania produce available at neighborhood farmers markets during the springtime. Youth learned that all food has its origin on a farm and that there are farms all over southeastern PA. This lesson taught youth that buying local fruits and vegetables helps support their community since they are "buying from their neighbors" and local food is easy to find at the farmers' market in their community. The lessons also taught youth to identify which fruits and vegetables can grow in southeastern PA. At the conclusion of each lesson, every child prepared their own "salad shaker" using local salad greens, such spinach and lettuces, as well as local carrots and apples. Produce was purchased weekly from Pennsylvania farmers at local farmers' markets and was dressed with a simple honey mustard vinaigrette the youth mixed themselves. Around 400 children participated in this lesson series. A brief written survey was administered following the lesson, which showed that 85% of children could successfully identify a local food. Overall, 96.5% of children enjoyed the lesson and 4 out of 5 children said they would ask their parents to buy local produce.

This May (2012), all 88 Philadelphia Department of Recreation centers with afterschool programs received a nutrition education packet with simple nutrition education lessons to teach children about Pennsylvania produce and healthy snacking. Included were activities designed to teach youth that healthy food comes from farms and identify which foods can grow in Pennsylvania. The packet was part of a popular year-long series of monthly nutrition lessons and reached approximately 2,800 children. This summer, our team created a summer nutrition newsletter for all 120 recreation center summer camps featuring two simple activities using Pennsylvania produce. The activity for younger children included reading the book, Growing Vegetable Soup by Lois Elhert, which was distributed to each camp. Children could then recreate their own version of the book by crafting paper-cut pictures featuring local fruits and vegetables. Summer staff members were also given the option of preparing their own vegetable soup with the children featuring summer season vegetables. Older children were challenged to create their own healthy beverages with local fruit such as berries, melons, and peaches in a "cook-off" style competition.

- **Experiencing local food at community farmers' markets:** To complement these nutrition lessons, Trust staff led eight field trips to six different farmers' markets and one West Philadelphia farm to allow children to learn more about local produce. Youth from recreation center summer and afterschool programs walked to their nearest farmers' market (sometimes just across the street) to learn about Pennsylvania spring and summer produce, meet the farmers, and learn about how different fruits and vegetables grow. At each field trip, the children received bags of seasonal produce to share with their family. This PA-grown produce included strawberries, asparagus, blueberries, corn, peaches, and sugar snap peas. A pre-survey, taken before the field trip, showed that nearly all children were able to identify the four seasons, but only 16% could correctly identify a vegetable that grew in the current season, spring. Despite living within

walking distance of their neighborhood farmers' market, only 60% had ever been to a farmers' market before the field trip. By the end of the trip, many children had tasted vegetables such as PA-grown asparagus and snap peas for the first time. Perhaps more importantly, many children cited "talking with the farmer" as their favorite part of the field trip and were excited to show their parents the market later in the season.

- **Distributing Philly Food Bucks to children and families:** To encourage parents and their families to shop at farmers' markets and eat more PA-grown fresh fruits and vegetables, Trust staff sent information home to parents of children in 26 recreation centers in low-income city neighborhoods about nearby farmers' markets, along with "Philly Food Bucks," which are coupons to receive $2 off their next $5 purchase of local fruits and vegetables at the market. Where possible, the coupons were distributed to parents immediately following their children's field trip to the local market. Families also received information about using their ACCESS (food stamp) cards at the markets, which enabled them to receive more Philly Food Bucks coupons to further increase their consumption of fresh PA-grown produce. The children's energy and enthusiasm about the market, combined with the prospect of discounted produce, served as a great incentive for parents to visit the market again as a family. Recreation staff reported that parents were excited to receive Food Bucks and the coupons encouraged families to purchase local fresh produce when they might not have otherwise. So far, $2,704 worth of Philly Food Bucks (supported through separate grant funding) were used by recreation center families to purchase fresh, PA-grown produce at 20 different farmers markets.

- **Conducting family cooking workshops:** During the grant period, Trust staff organized and led several cooking workshops for youth and their families at the recreation centers. Two recreation centers in low-income Philadelphia neighborhoods, Lower Mayfair and American Legion, participated in a 4-week Healthy Family Cooking workshop series in the month of June. During the weekly two-hour workshops, parents and children learned healthy cooking techniques and recipes, using local ingredients. Families made tasty dinners with PA-grown produce, such as Chard and Potato Enchiladas with a Rhubarb Parfait for dessert. Participants received Philly Food Bucks coupons to purchase fresh local fruits and vegetables, and copies of *Chop Chop* magazine (a healthy cooking magazine for children), which featured several seasonal recipes using local PA ingredients.

In addition, in October 2012, Trust staff piloted an adult nutrition education and cooking series. Through separate funding, Trust staffers, to date, have conducted twenty 6-week workshops with 310 participants in Philadelphia and the surrounding five-county area, teaching low-income adults how to shop for and cook healthy meals on a budget. The program has been a great success and will be doubling in sites for a total of 12 in fiscal year 2013. The project, called "PEACH" (for People Eating and Cooking Healthy), focuses on cooking healthy food that is both delicious and affordable. To reinforce and promote the goals of our PDA Specialty Crop Project grant, the project team included local produce in the recipes, included Pennsylvania-grown tomatoes, lettuce, arugula, zucchini, and apples. As an added component of this workshop series, the course includes trips to local farmers' market. Thirty participants also received $4-$6 each in Philly Food Bucks to spend at the market for fresh local produce.

- **Developing youth leadership skills.** During the 2010- 2011 school year, The Food Trust also began piloting youth councils in three recreation centers, through separate grant funding that complemented our work on the Specialty Crop Grant Program. This year (2012), the youth councils were expanded to four different recreation centers. Youth councils are groups of older youth who are identified as leaders at their recreation centers. During council meetings, members learn about the importance of healthy eating and physical activity. Following each lesson, youth council members taught younger children at the center what they had learned. With support from our PA Specialty Crop grant, last summer at two centers, our staff

	integrated an activity to teach youth about the benefits of consuming fresh local produce. Council members learned about the health benefits of locally grown blueberries, how they can be enjoyed, and where they can be purchased locally. Council members then taught their younger peers at the recreation center about local blueberries and passed out washed and bagged samples for everyone to enjoy. PA-grown blueberries were purchased from a nearby farmers market. This spring (2012), three youth councils hosted farm stands. First, youth council members ran a taste test of Pennsylvania-grown strawberries and cherries with their peers. All families were then offered the opportunity to purchase pints of these fruits a week later. Youth council members were given the tasks of collecting order forms, keeping track of money, and packing up the orders. Trust staff purchased the fruit in bulk from Highland Orchard in West Chester, PA and Highland Orchards in Biglerville, PA. Each pint was sold for $1.00 to make sure the produce was affordable to all recreation center families. The farm stores were tremendous success for farmers and families alike. In total, 120 pints of strawberries and 50 pints of cherries were enjoyed by roughly 70 families. Each order came packed in a reusable grocery bag along with an info sheet about the farmer who grew the fruit, information about Philly Food Bucks and a map of area farmers' markets.
Goals and Outcomes Achieved:	**Goal #1:** Increase sales of PA-grown fruits and vegetables among the Pennsylvania farmers who sell fresh fruits and vegetables at The Trust's network of farmers' markets in Philadelphia. *Outcomes:* The project benefited more than 60 Pennsylvania farmers who sold fresh produce at The Food Trust's network of farmers' markets in the city and, during the grant period, a number of farmers' markets in low-income neighborhoods set new records for both overall produce and ACCESS card sales during the project period. Sales of PA-grown produce were boosted by increased promotion and awareness, including youth field trips to the markets, as well as Philly Food Bucks, a coupon incentive program that provided ACCESS-card users with $2 in fresh local produce for each $5 they spent using ACCESS cards. At the end of the 2011 farmers' market season, The Food Trust's evaluation team surveyed farmers who sold their fresh produce at Food Trust farmers' markets in high-poverty neighborhoods. Key findings showed that 92% of farmers received Philly Food Bucks as a form of payment at the market, and 70% of farmers reported an increase in their sales of fruits and vegetables because of the Philly Food Bucks program. All farmers reported that the logistics of accepting Food Bucks were "easy" or "very easy." **Goal #2:** Increase knowledge of the benefits of eating fresh local produce among inner-city children who participate in nutrition education activities at city recreation centers. *Outcomes:* Field trips for youth to nearby farmers' markets were an important learning component of this project. A pre-survey showed that nearly all children were able to identify the four seasons, but only 16% could correctly identify a vegetable that grew in the current season, spring. Despite living within walking distance of their neighborhood farmers' market, only 60% had ever been to a farmers' market before their planned field trip. By the end of the trip, many children had tasted vegetables such as PA-grown asparagus and snap peas for the first time, all were able to identify these as seasonal local vegetables. Perhaps more importantly, many children cited "talking with the farmer" as their favorite part of the field trip and were excited to show their parents the market later in the season. Food Trust staff also provided nutrition education to youth to educate them about the benefits of fresh local produce. A brief written survey administered to youth following this education showed that 85% of children could successfully identify a local food. Overall, 96.5% of children enjoyed the lesson and 4 out of 5 children said they would ask their parents to buy local produce. **Goal #3:** Improve knowledge and skills among parents and caregivers of urban youth for preparing and cooking fresh PA produce.

	Outcomes: Parents and caregivers of youth participating in our Recreation Center programing received information about where to purchase local PA produce, the benefits of buying local, and simple recipes featuring in-season PA fruits and vegetables. Recipes provided were the same as those prepared by their children in their afterschool program to give parents the confidence to prepare the same recipes at home. Parents also received information on storing fresh produce to prolong its shelf life and tips for freezing to preserve quality. Approximately 75 parents, caregivers, and children participating in our family cooking workshops gained firsthand experience preparing fresh PA produce including less common products such as rhubarb and Swiss chard. Children of participants were invited to cook alongside their parents to prepare and taste the recipes themselves. Adults participating in our adult-nutrition education pilot program learned how to cook healthy meals on a budget by preparing recipes from start to finish, at conveniently located sites in their communities such as churches and libraries. In addition to preparing meals featuring PA-grown fruits and vegetables, the 310 participants in the 6-week series also received groceries to take home and prepare the recipes for their family. As part of the series, participants identified strategies for purchasing PA produce on a budget, discussed the importance of washing fresh produce before consumption, and reviewed the important role fruits and vegetables play in promoting good health and preventing disease. Program evaluation showed that virtually all participants were motivated and informed to cook more often at home with their children after completing the 6-week series of classes.
Beneficiaries:	The primary beneficiaries of this project were the approximately 60 Pennsylvania farmers who vended at Food Trust farmers' markets in the City of Philadelphia, and the approximately 10,000 children in low-income neighborhoods in Philadelphia who learned about and tasted PA-grown produce as part of nutrition education activities provided in public schools and afterschool programs. The project also benefit approximately 310 adults in low-income neighborhoods who attended cooking workshops where they learned about PA-grown fresh fruits and vegetables, and 88 City of Philadelphia Recreation Centers, which benefited from the provision of high-quality afterschool and summer programming for low-income youth, focused on healthy eating and learning about local, PA-grown fruits and vegetables.
Lessons Learned:	The Food Trust's project team has been pleased with its progress, and implementation of program activities has generally gone smoothly. Participation in the community cooking workshops, for example, has greatly exceeded our expectations, with strong demand for this program and plans for expansion. Our project team continues to be challenged to navigate changing funding for our recreation center program, so we can continue to work with youth in the coming year to promote good nutrition and knowledge of the benefits of fresh, local produce. One of the most powerful experiences for the youth who participated in these grant activities was the educational field trips to nearby farmers' markets, where they got to see and sample PA-grown produce and meet PA farmers. The youth were highly enthusiastic. However, a challenge was that a number of recreation centers were not located close to farmers' markets. With additional transportation funds, we would have organized additional bus trips for even more centers, and hope to do so next year.
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Additional Information:

Youth from Francisville Recreation Center in Philadelphia visit the Fairmount farmers' market and learn about PA-grown asparagus. Below, youth from 8th and Diamond Playground, a recreation center in Philadelphia, learn the difference between how tomatoes and potatoes grow on Mount Pleasant Farm in PA, at the Cecil B. Moore farmers' market in North Philadelphia

Above, youth from Clemente Playground in Philadelphia receive bags of PA-grown spring produce to take home to their families. Below, 120 pints of local strawberries from Beechwood Orchards in Biglerville, PA were sold at three youth-run farm stores in low-income Philadelphia neighborhoods.

Youth leaders at Cruz Recreation Center in Philadelphia pack up PA-grown strawberries at their farm store. Each customer received information about the grower and a map of local farmers markets.

Parents of children at Clemente Recreation Center in Philadelphia each received $6 in Philly Food Bucks to purchase fresh, PA-grown fruits and vegetables following the group's visit to the nearby Fairmount farmers' market.

Children at the Francisville Playground Recreation Center learned about the seasonality of fresh PA-grown produce before their May 2012 trip to a nearby local farmers' market.

Project Title:	**A Case Study of Pennsylvania's Simply Sweet Onion: A possible Model for Market Development of Specialty Crops, Project 27**
Project Summary:	The lack of successful marketing and grower models has been identified as a limitation in the expansion of specialty crops in the Mid-Atlantic region. Two previously funded USDA research initiatives identified this need as well as other issues and concerns for a stronger fruit and vegetable industry in the region. Pennsylvania's Simply Sweet Onion® will be going into its' 12th season with a firmly established position in the marketplace with sales at the wholesale level approaching $1 million and a growing demand. There were multiple grower efforts to capitalize on this new product with varying levels of success. This case study was done in the hopes of developing both grower and marketing models for future use in the Mid-Atlantic region.
Project Approach:	In excess of 60 hours was spent interviewing 22 participants including growers, support staff, marketers and key players in the program's development. Additionally, data was gathered on growth in production and sales and the financial condition of the grower groups involved. The net result of this study was the generation of both marketing and grower models and a partial list of "red flag" situations to be avoided. As noted in more detail in the full report, there were some limitations in the gathering of the data. This included the surprising reluctance of a local economic development group to share information of any sort about a failed business venture centered on the PA. Simply Sweet Onion. The junior author, Craig Sweger, was an invaluable aid in his role as de facto editor maintaining objectivity in the report. Likewise, the information that served as the basis for this study would not have been available without the frank openness of those

	interviewed. Outreach included; 1) A thumbnail of the research appeared in PVGA newsletter. 2) Findings were presented at the annual Mid-Atlantic vegetable growers conference in Hershey under the wholesale marketing section.
Goals and Outcomes Achieved:	This case study was successful in achieving the goal of developing marketing and grower models when dealing with the wholesale market segment. The study also details the trial and error process involved in developing a new product from one acre of production with an approximate value of $5,000 into 100 acres and a value of $1 million and growing. Additional information is provided in the full report.
Beneficiaries:	The results have been made available to other grower groups within the region via the PVGA newsletter and speaking events. From the narrow perspective of the Commonwealth of Pennsylvania, the economic impact of the Simply Sweet Onion program has been significant. Prior to the development of the SSO, Pennsylvania was not a player in the "super sweet onion" arena and had no significant production. The branded and federally trademarked product is now distributed by virtually every major grocery chain in the state. This "signature crop" has been used as a door opener to move additional varieties of produce into the same supply and distribution network with a current projected value of $350,000-$500,000. For the grower group in Lancaster County, the projected dollar impact to their local economy (without using any "multiplier factors") for 2011 was $1.1-$1.5 million. It is hoped that the two models developed can provided similar results elsewhere within the region. The final report will be made available through the PDA and Penn State Extension, Dr. Mike Orzolek.
Lessons Learned:	One unexpected outcome of initiating this project was the identification of a need for a better interface of land grant university research and researchers with professional marketers and businessmen to bring their developments into the marketplace. While this does not appear to be a problem at the university level with high tech developments like robotics and medical technology, this does not seem to be the case with new developments in plant materials, growing techniques etc. This may be an issue that needs to be addressed at a level above the field researcher. An insight to be shared as a caution to others is the reluctance of politically affiliated groups such as economic development agencies to provide information particularly if it has a potential negative impact on their organization. Politics do play a part in the ready access to information. This lack of ready access can only be solved to a limited degree and only with a considerable expenditure of additional time, effort and monies. Researchers should not anticipate cooperation simply because an organization receives public funding nor should they assume willingness by these organizations to help others avoid the same pitfalls they encountered. "Success has 1000 fathers. A failure, none." Survey work such as this requires objective filtering mechanisms. Comments, observations and "facts"(oft times actually opinions) from individuals directly impacted by a success or failure need to be tempered with objective viewpoints from disinterested parties or a biased perspective in the conclusions will result.
Contact Person:	Michael E. (Mike) Kotz, 724-663-4386, mkotz@linequest.net
Additional Information:	PA SSO Case Study 1) Outreach Activities; A) A copy of the report was given to Ann Dugan at the University of Pittsburgh Katz School of Business. It will be used as part of the criteria in evaluating the potential success or failure of agricultural oriented projects. It will also be used to provide clients considering ag ventures into wholesale markets. B) Thumbnail version of the report was printed in the PVGA newsletter. This publication has a circulation of 967 PVGA members and a total circulation of 1,100. C) The case study was presented at the Mid-Atlantic Fruit and Vegetable Growers conference, in the wholesale marketing section.

Project Title:	**Mushroom Industry Specialty Crop Project**
Project Summary:	The Mushroom Industry Specialty Crop Project will feature selected business and workforce development activities intended to address the following specific needs of the mushroom industry: workplace safety, technology implementation, MGAP best practices, and business skills development. Training will be offered to workers and supervisors in each of these areas. The training programs have been developed in collaboration with the American Mushroom Institute, La Comunidad Hispana, and leading mushroom companies to train in small-group formats; achieve maximum interaction of trainees; provide for hands-on demonstrations at the work sites and set the stage for subsequent turnkey training. To the extent the budget allows, up to 125-250 workers and supervisors will be integrally involved in the training according to enclosed detailed work plans over the 15-month duration of the project. Project outcomes will be measured and data will be analyzed during the implementation and monitoring of the project in a three-county region (Berks, Chester, and Delaware Counties) involving nearly 50 mushroom-growing companies. The Chester County Economic Development Council will manage and administer the project and provide supplemental business retention and capital acquisition consultation to the mushroom growers in the process. The intent of the project is to address critical business and workforce development needs identified by the mushroom industry with targeted access to professional training and related consultation for business retention and expansion and acquisition of requisite capital. More than 64% of the freshly-cultivated mushrooms in the nation are grown, harvested, packaged and processed in Pennsylvania and approximately 90% of Pennsylvania mushroom growers are clustered in Berks, Chester and Delaware Counties. According to those growers, they need to share and adopt best operation practices; improve their business development skills; upgrade the safety, stability, supply, and training of mushroom workers. The impacts of this project will be felt on the 50-or-so participating growers and the mushroom industry-at-large who are the direct beneficiaries of the project's activities, services and consultations. In effect, the trained personnel will possess higher-order skills; marketing, outreach and recruitment will be enhanced; workplaces will be safer; technical skills of workers will be improved; and business practices will be upgraded by this project. The profits, productivity, and business expansion (the economic side of the industry) will benefit substantially from those impacts.
Activities Performed:	Due to the delay in receiving the amendment, this project has just begun and no reporting is ready as of 12/5/2012.
Problems and Delays:	Delay in receiving amendment.
Future Project Plans:	A revised timeline will be provided.
Funding Expended to Date:	Funds expended to date $0
Contact Person:	Jodi Gauker, Agriculture Program Manager, Chester County Economic Development Council (CCEDC) Eagleview Corporate Center, 737 Constitution Drive, Exton, PA 19341 office: 610.321.8226, fax: 610.458.7770, email: jgauker@cceconomicdevelopment.com website: cceconomicdevelopment.com

	upcoming events: cceconomicdevelopment.com/calendar.php
Additional Information:	Received Amendment and Extension 8/14/2012
Project Title:	**Good Agricultural Practices Training and Support for the Pennsylvania Fresh Produce Growers**
Project Summary:	Food borne disease outbreaks and recalls from contaminated fresh fruits and vegetables continue to occur in the U.S. To date, no incidents have been traced to produce grown in Pennsylvania. Nevertheless, the impact of these events is being realized throughout the county. To limit potential liability issues associated with outbreaks and recalls, wholesale produce buyers are increasingly demanding that, as a condition of purchase, grower suppliers provide documented evidence of safe farm food safety practices, known as Good Agricultural Practices (GAP). GAPs include procedures for food handler hygiene, irrigation water testing, wildlife control, use of raw and composted animal manure, post-harvest sanitation, product traceability, and recordkeeping procedures. Compliance with GAP standards has typically been met through evidence of 1) training in farm food safety, 2) a written farm food safety plan, and/or 3) certification obtained by a third party farm inspection. An increasing trend for wholesale growers to require food safety training, farm food safety plans, and/or third party inspections has been documented by our GAP research group in a recent publication[1]. We must continue GAP training programs will wish to expand to reach out to Pennsylvania growers, packers, and distributors of fresh produce who market products through the many food hubs that operate in Pennsylvania including cooperatives, produce auctions, and distributors. Our experience is that farmers market managers, farm-to-restaurant programs, farm-to-school programs, school and hospital garden to cafeteria programs, urban farming, Community Supported Agriculture (CSI) programs, and Master Gardener programs are also recognizing their own food safety liabilities and therefore need training for their produce growers and handlers on safe production, handling, and storage of fresh produce. Our observation, however, is that many produce buyers overestimate the growers' abilities to create a documented food safety plan that meets global food safety standards while underestimating the work and expense involved. In 2012, Penn State Extension and the Department of Food Science prepared a 5 hour curriculum and trained 540 Pennsylvania growers between January and April. Because of time and resource limitations, we found it necessary to focus our efforts on Lancaster and surrounding counties. To date, most educational events have been planned and conducted by Dr. Luke LaBorde of the Penn State Department of Food Science, who also has teaching, research, and extension responsibilities in other statewide and national food safety and quality programs direct to growers, processors, and consumers. An educator who can coordinate and conduct statewide programming is necessary to work with Dr. LaBorde to continue and expand GAP training efforts. As new commercial mandates for compliance with global farm food safety standards increase and documentation requirements become more onerous to growers, our training objectives must change to keep up with the times. In the face of these new information demands, budget cuts have resulted in a reduction in the number of extension educators available to provide training. New external funding streams are therefore essential to maintain the level of support that Pennsylvania produce growers demand. We propose to use these grant funds to hire a highly qualified person to co-direct the GAP extension program along with Dr. Luke LaBorde. The ideal candidate for this position would have a M.S. degree and/or experience in agricultural outreach education. Activities would include designing, developing, and implementing educational programs through presentations, workshops, conferences, extension in-service sessions, mass media, individual contact, and demonstrations. This person should have a history of collaborations and

	understanding of Pennsylvania food hubs including grocery stores, restaurants, produce auctions, cooperatives, distributors, and farmers markets. She/he should have a history of working with underserved audiences including the Amish and Mennonite communities in addition to Spanish speaking growers and harvesters. The extension associate will be located in the southern part of the state where produce growers are concentrated, although she/he will be required to work with extension agents to coordinate and deliver GAP programs throughout the state. Dr. LaBorde has already prepared a farm food safety curriculum consisting of PowerPoint slides, posters, a worker training flip chart, brochures and reference materials. The candidate will help to review the current materials to assure they are current with respect to global food standards, such as the Harmonized GAP standards and upcoming FDA regulations, and will supervise and work closely with the extension associate to deliver training and create new materials appropriate for specific target audiences.
Activities Performed:	In the process of interviewing candidates for the agricultural outreach program.
Problems and Delays:	Amended to add project on 9/24/2012.
Future Project Plans:	Compile and review evaluation data collected in the Spring and Summer 2012 workshops and presentations and make any necessary content and style changes. Develop new training modules focusing on skills necessary to write a food safety plan and pass a USDA audit. Work with the PSU web team to redesign, as necessary, the PSU Farm Food Safety web site to serve as an informational platform for GAP curriculum materials and information resources. Review new FDA produce safety standards (draft or final, depending on FDA timeline) and Harmonized GAP standards and make any necessary content changes to GAP curriculum materials. Coordinate an extension in-service on new GAP requirements to extension educators (also open to PDA personnel). Select training sites in coordination with food hubs (produce auctions, cooperatives, farmers market groups, etc. and with extension educators for statewide GAP training. Conduct GAP training at 6 locations throughout the state. Compile data from workshop evaluations
Funding Expended to Date:	Funds expended to date $0
Contact Person:	Luke LaBorde, Associate Professor of Food Science (Project Coordinator) Telephone: 814-863-2298 Email: lfl5@psu.edu, The Pennsylvania State University, Department of Food Science, 202 Food Science Building, University Park, PA 16802
Additional Information:	Received Amendment and Extension 9/24/2012