pennsylvania
DEPARTMENT OF AGRICULTURE

FY2011
Specialty Crop Block Grant Program
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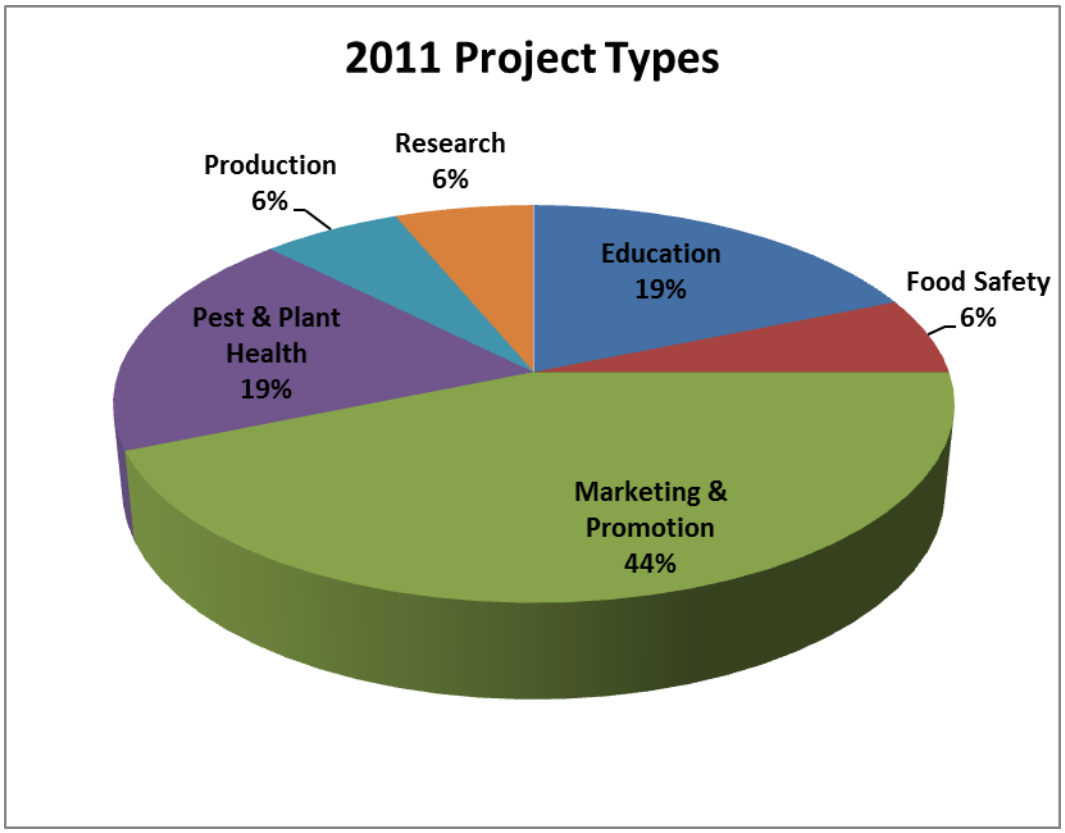
Background:	**FY2011 Pennsylvania Department of Agriculture Specialty Crop Block Grant Summary**
	In 2011, the Pennsylvania Department of Agriculture (PDA) was awarded $1,043,305.42 to promote the Specialty Crop industry throughout the state. Affirmative steps were taken to conduct state outreach to 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 sixteen (16) projects were awarded funding. These projects are ongoing and an annual report for each is below. 
Project Title:	**Combating Invasive Pathogens, Project 6**
Project Summary:	Increasing international and interstate commerce and agricultural trade accelerate the movement of specialty crop pathogens. Invasion of exotic pathogens poses a multifaceted threat to the production and marketability of specialty crops in Pennsylvania. Besides crop loss, disease outbreak increases costs for plant

	care, chemical-based protective measures may negatively affect surrounding terrestrial and aquatic ecosystems, and infestation of exotic pathogens incurs huge indirect cost due to required regulatory actions and reduced crop marketability. We have closely worked with the Pennsylvania Department of Agriculture (PDA) to enhance the PDA's capability of detecting and identifying high-risk pathogens. This partnership has resulted in key data, knowledge and diagnostic tools that contribute to protecting multiple specialty crops in Pennsylvania from multiple disease problems. This project was built on this partnership and aimed to improve the detection and management of three major pathogens, one of which was bacterial spot of tomato and pepper caused by several Xanthomonas species. The second target was chrysanthemum white rust, caused by Puccinia horiana. The last group was Phytophthora that cause disease in ornamental plants. Results from this project helped understand temporal and spatial dynamics of these groups of pathogens.
Project Approach:	**1. Activities and Tests Performed** Our activities during the reporting period can be divided into the following specific areas. Resulting data and significant findings for each area are described in GOALS AND OUTCOMES ACHIEVED. 1.1. Detection and identification of *Xanthomonas* species associated with bacterial spot of tomato and pepper 1.2. Development and optimization of Real-Time Polymerase Chain Reaction (RT-PCR)–based diagnostic methods for detecting and differentiating *Xanthomonas* species 1.3. Characterization of occurrence and inoculum sources of chrysanthemum white rust 1.4. Improvement of *Phytophthora* Database 1.5. Survey of bacterial canker 1.6. Pathogens detected in the samples submitted to PDA **2. List of All personnel Associated with the Project and Their Roles:** **Dr. Seogchan Kang**, Professor of Plant Pathology at Penn State, coordinated the project, designed the experiment, supervised the Penn State participants, and prepared the report **Dr. Seong H. Kim**, Adjunct Professor of Plant Pathology at Penn State and Plant Pathologist Supervisor at PDA, supervised Olson and Nikolaeva, processes samples submitted to the lab, and helped prepare the report. **Tracey N. Olson**, Plant Pathologist at PDA, conducted bacterial pathogen isolation and identification. **Dr. Ekaterina Nikolaeva**, Research Associate at Penn State, ran all molecular diagnostic assays and developed/optimized new PCR-based diagnostic tools for bacterial pathogens described here. **Dr. JungEun Kim**, Postdoctoral Fellow at Penn State, contributed to identifying Phytophthora via sequencing of the ITS region. **Bongsoo Park**, PhD candidate at Penn State, curated and updated Phytophthora Database.

Goals and Outcomes Achieved:	**1. Goals and Accomplishments** **1.1. Detection and identification of *Xanthomonas* species associated with bacterial spot of tomato and pepper:** Bacterial spot of tomato and pepper is caused by four species including *X. vesicatoria, X. perforans, X. euvesicatoria,* and *X. gardneri*. This disease has been a chronic problem in PA and is often associated with tomato transplants shipped from other states (approximately 15 million transplants annually). Among these, *X. gardneri* had not been considered to be present in the United States until the first report of its discovery in the United States by us in 2010. Since 1984, plant inspectors have submitted a total 5,035 clinical samples from tomato and 911 from pepper to the PDA Plant Disease Diagnostics Laboratory. Among these specimens, 178 strains of presumptive Bacterial Spot Xanthomonads (BSX) have been isolated and achieved. We have identified BSX strains achieved in PDA to understand their genetic diversity and distribution over the last ~30 years. The disease incidences have increased markedly since 1999 with *X. perforans* and *X. gardneri* being dominant species (67% and 21%, respectively) causing BSX in Pennsylvania. Based on genetic fingerprinting by BOX PCR and sequencing of the 16S ribosomal RNA (rRNA) encoding gene, 15 strains were identified as *X. euvesicatoria* (1987-2012), one as *X. vesicatoria* (1996), 28 as *X. gardneri* (1995-2012), and 89 as *X. perforans* (1994-2012). All *X. gardneri* and *X. vesicatoria,* and most of *X. perforans* strains have been isolated from tomato samples, while most of *X. euvesicatoria* strains have originated from pepper, suggesting possible host preference/specificity among these *Xanthomonas* species. One *X. euvesicatoria* strain was isolated from cucumber and was shown to be pathogenic to tomato and pepper. **1.2. Development and optimization of Real-Time Polymerase Chain Reaction (RT-PCR)–based diagnostic methods for detecting and differentiating *Xanthomonas* species:** A total of 133 PDA BSX strains were tested with eight published conventional PCR primer pairs that were designed to detect BSX. The RST65/69 primer pair gave positive results with most of *X. perforans* and all *X. euvesicatoria* strains, as well as one *X. gardneri* and eight non-BSX strains. Three primer pairs, including XCVF/XCVR, Xeu2.4/Xeu2.5, and Bs-XeF/ Bs-XeR, were highly specific to *X. euvesicatoria*; the Bs-XvF/Bs-XvR primers produced band only with *X. vesicatoria* strains. Most of the *X. gardneri* and *X. perforans* strains isolated in Pennsylvania appeared to be positive with the Bs-XgF/ Bs-XgR and Bs-XpF/Bs-XpR primers, respectively. To address the need for deploying a fast, reliable, sensitive and specific method for detecting *X. gardneri* in infected plant materials, a multiplex real-time PCR assay has been developed. We have designed a PCR primer pair and a probe specific to the part of the unique *X. gardneri* XGA_0724 gene, a gene encoding the putative type III effector arvBs1 class that is possibly associated with increased virulence in tomato. These primers and probe were successfully in detecting *X. gardneri* from tomato and pepper in multiplex PCR with Cox primers and probe specific to the plant cytochrome oxidase gene as a control for plant DNA. Our method can simultaneously detect the presence of *X. gardneri* and assess the quality of PCR reaction via quantification of both bacterial and plant DNAs. Detection of 10^3 CFU of *X. gardneri* in 100 mg plant tissue was successful for both tomato and pepper with total DNA extracted using a commercial DNA purification kit (Qiagen DNAEasy). We have evaluated the specificity of this method using *X. gardneri* strains isolated from clinical samples submitted to PDA. All PCR positive results were confirmed by *X. gardneri* culture isolation and BOX-PCR profiles. All non-*X. gardneri* strains appeared to be negative. However, in a few cases highly concentrated DNA samples from *X. euvesicatoria* and *X. perforans* produced Ct value close to 35-40, while undiluted DNA from *X. gardneri* always tested in a range of Ct 16-23. Those weak false positive results could be eliminated by adding1 1.5% formamide in real-time PCR reactions. **1.3. Characterization of occurrence and inoculum sources of chrysanthemum white rust:** Among 51 clinical chrysanthemum samples analyzed, 21 were infected with *Puccinia horiana*, the causal agent of chrysanthemum white rust. This disease was detected at 14 different sites in six PA counties. The infected plants were collected from six nurseries, seven greenhouses, eight garden centers, and two produce auction

sites. The planting sizes ranged from 2 to 5,000 mums and total of 24,324 mums were exposed to *P. horiana*, of which 8.2 % were destroyed under the supervision of plant inspectors. The rust occurrence distribution in Aug, September, and October were 8.7, 56.5, and 34.8 %, respectively. The trace-back investigation could not resolve the sources of inoculi. Two samples exhibited symptoms and signs of both white and brown rusts. The inoculum sources of *P. horiana* outbreaks in spring season (2007 and 2010) were traced back to infected mums over-wintered in PA, whereas the outbreaks in fall season (2004, 2006, 2008, 2009, 2011, and 2012) could not been traced back to the carryovers from the previous year (over-wintered).

1.4. Improvement of *Phytophthora* Database: *Phytophthora* cultures (>500) isolated from diseased ornamental samples submitted by plant inspectors and growers to PDA have been characterized to determine their species identity via sequencing of the internal transcribed spacer (ITS) region of ribosomal RNA-encoding genes. The cultures have been stored at PDA and the resulting sequence data have been archived in Phytophthora Database (www.Phytophthoradb.org), an online community resource that was developed to support accurate and rapid identification of newly isolated *Phytophthora* and to help characterize and catalog the diversity and evolutionary relationships within the genus. Its sequence database has grown from sequences of 1-9 phylogenetically informative loci from ~1,500 isolates (representing 82 species) in 2008 to sequences of 1-12 loci from ~2,600 isolates (representing 133 formally described and provisionally identified species). Sequences of multiple mitochondrial loci were added to complement phylogenetic analyses and diagnostics tool development based on nuclear loci. Key morphological and growth characteristics of most newly described and provisional species have been summarized. Other additions to improve PD functionality include: a) Geographic Information System tools that enable users to visualize the geographic origins of chosen isolates on global-scale maps, b) tool for comparing genetic similarity between isolates via microsatellite markers to support population genetic studies within species, c) comprehensive review of molecular diagnostics tools, relevant references, and the sequence alignments used to develop PCR-based diagnostics tools to support their utilization and new tool development, and d) an online community forum for sharing and preserving experience and knowledge accumulated in the global *Phytophthora* community.

1. 5. Bacterial canker: In two cases *Clavibacter michiganensis* subsp. *michiganensis* (CMM) and Bacterial Spot *Xanthomonas* (BSX) were isolated from the same tomato samples. Two more tomato samples were shown to be positive for CMM via isolation and real-time PCR. DNA from different parts of the plants was extracted with Qiagen kit and subjected to real-time PCR. All samples collected from symptomatic leaves, small and big stems, and fruits appeared to be positive. A Black Nightshade (*Solanum ptycanthum)* sample from a tomato field heavily infected by CMM was investigated. Despite the absence of typical bacterial canker symptoms, all tested parts of the plant, including stems, leaves, and fruit stems appeared to be positive by CMM–specific real-time PCR. We are currently attempting to culture CMM from these samples. Tomato seeds "Mountain Fresh" submitted to PDA were investigated for potential presence of bacterial canker but were shown to be negative by real-time PCR. Genomic DNA extracted from 48 cultures of CMM stored in PDA was analyzed using a previously developed species–specific real-time PCR method. Forty of them were confirmed to be CMM. Good quality of DNA from 8 negative cultures was confirmed with Bacterial UniProbe real-time PCR. BOX PCR of PA CMM strains revealed at least four distinct fingerprinting profiles, suggesting the presence of at least four populations of CMM in Pennsylvania.

1.6. Identification of pathogens detected in the samples submitted to PDA: Samples submitted to the PDA Diagnostic Laboratory, mostly by PDA plant inspectors and Penn State Extension and IPM specialists, have been analyzed to support inspection, certification, survey, extension services, and regulatory programs. The total number of diseased samples was 645, which came from 184 different hosts. The biotic and abiotic disease distribution among planting types and the most frequently encountered pathogens are summarized

in Tables 1 and 2.

Table 1. Pattern of pathogen distribution among the samples submitted to the PDA Plant Disease Diagnostic Lab in 2012

Planting Type	Pest distribution, % (Based on 1376 samples collected by PDA plant inspectors)						
	Bacteria	Fungus	Nematode	Virus	Insect	Abiotic	**TOTAL**
Field	0.6	3.5	0.0	0.5	1.3	3.3	**9.1**
Forest	0.0	0.2	0.0	0.0	0.1	0.1	**0.5**
Garden Center	0.7	7.8	0.9	0.6	0.9	7.5	**18.5**
Greenhouse	0.7	9.9	0.0	3.7	1.2	14.1	**29.5**
Nursery	0.3	13.9	0.4	0.4	3.6	12.0	**30.5**
Orchard	0.0	0.1	0.0	0.0	0.0	0.2	**0.3**
Park	0.0	0.7	0.0	0.1	0.0	0.7	**1.5**
Residence	0.1	0.9	0.0	0.2	0.8	2.2	**4.3**
Vegetable Transplants	0.1	0.0	0.0	0.0	0.0	1.6	**1.7**
Other	0.2	0.8	0.0	0.1	1.2	1.8	**4.1**
TOTAL	**2.7**	**37.8**	**1.3**	**5.6**	**9.1**	**43.6**	**100.0**

Table 2. Most frequently encountered diseases in Pennsylvania, 2012[a]

Pathogens	Number of diseased samples																
	Spruce, blue	**Chrysanthemum**	**Tomato**	**Douglas-fir**	**Boxwood**	**Butterfly-bush**	**Million bells**	**Begonia**	**Douglas-fir**	**Impatiens, Garden**	**Gernaium, Zonal**	**Annual Chrysanthemum**	**Impatiens, New Guinea**	**Frazer-fir**	**Spruce, Serbian**	**Lobelia**	**TOTAL**
Puccinia horiana		26															**26**
Stigmina lautii	16														3		**19**
Phytophthora cryptogea	1			11										5			**17**
Phaeocryptopus gaenumanni				11					6								**17**
Botrytis cineria			5				3	4			2	1	1				**16**
***Pythium* sp.**		4					6	1			4	1					**16**
***Aphelechoides* spp.**		1				14											**15**
Rosellinia herpotrichoides	14													1			**15**
Impatiens Necrotic Spot Virus			1					2		4			3			3	**13**
Chrysomyxa weirii	11														2		**13**
Voulutella buxi					12												**12**

Cylindrocladium pseudonaviculatum					11													**11**
TOTAL	**42**	**31**	**6**	**22**	**23**	**14**	**9**	**7**	**6**	**4**	**6**	**2**	**4**	**6**	**5**	**3**		

[a] Pathogens detected >10 times in 2012.

First record of Rosellinia needle blight in PA. For the first time in PA, Rosellinia needle blight caused by Rosellinia was detected primarily on Blue Spruce as well as Fraser fir and Canadian Hemlock. The infected needles on small branches inner-lower portion of trees were heavily blighted and covered with white fungus mycelium and spherical black beaked perithecia. A limited survey during January – September, 2012 indicated that the infected trees were found at six different localized areas in Schuylkill County.

Boxwood blight, Cylindrocladium pseudonaviculatum survey. PA plant inspectors have collected 107 boxwood samples from 22 counties for the 2012 boxwood blight survey, among which Cylindrocladium pseudonaviculatum (Cp) was detected in all samples from one location in Lancaster County. Boxwood collected in Winter (Jan and Feb) exhibited Cp mostly on fallen leaves, whereas the samples collected in Fall season (Sep and Oct) exhibited Cp on attached leaves that drop off soon after infection. Cp detection was enhanced when the suspected leaves were placed in moist conditions. At least 100 leaves were examined per samples for the detection.

Detection of Phytophthora ramorum from trace-forward samples. Pennsylvania has been combating the threat of the sudden oak death pathogen P. ramorum (Pr) moving into PA via nursery stocks since 2004. PA is still receiving Pr positive shipments from the west coast. In 2012, we have analyzed 97 Oregon Pr trace-forward samples composed of 11 different hosts, soil, and water. Rhododendron samples were PCR positive for Pr. All the plants were destroyed and the site areas were treated with Clorox under the supervision of plant inspectors. Samples of soil and water after the destruction and the Clorox treatment were all free of Pr.

Isolation of Phytophthora from clinical samples. Total of 161 cultures were isolated from clinical plant samples composed of Frazer fir, Douglas fir, Balsam fir, White fir, Eastern white pine, Honey suckle, Juniper, Petunia, Rhododendron, Potato, Russian cypress, Russian sourwood, and Tomatoes in 2012. These cultures were stored in our in long term storage for future analysis of their species identity. The resulting data will be archived in Phytophthora Database.

Beneficiaries: Data from this project made the following contributions: a) pathogen survey data support the recognition of unusual patterns of pathogen change or movement; and b) early detection and accurate identification of pathogens via enhanced pathogen diagnosis expertise and resources will facilitate rapid deployment of regulatory and/or management actions. 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 enhancing its diagnostics capability of detecting and identifying major pathogens threatening specialty crop production and marketing. The data generated from Phytophthora also benefited researchers around the world by providing a robust reference framework for identifying Phytophthora (see below for more info). Major impacts include:

1.Reduced crop loss due to rapid response to emerging pathogen threats: 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. We have developed and optimized molecular diagnostics methods for Xanthomonas species associated with bacterial spot of tomato and pepper and have also tested an existing method for detecting bacterial canker of tomato caused by Clavibacter michiganensis subsp. Michiganensis (CMM). Tomato bacterial canker has occurred sporadically,

	and the disease outbreaks peaked in 2008-10. In 2012, a tomato field exhibiting complete crop loss due to bacterial canker was investigated to determine the inoculum sources of CMM. Steve Bogash, a Penn State Extension vegetable specialist, collected the seed batch planted in the field and a potential weed host, Black nightshade growing in the CMM infested field. CMM was detected from symptomless Black nightshades but not from the seeds, which will lead to an emphasis on the importance of weed control in tomato fields. Plant inspectors have sampled Rhodococcus fascians (Rf) infected plants every year since 1988. However, the number of Rf infected samples has declined in recent years and none in 2012. The declining pattern of Rf occurrences in ornamental industry in PA was largely due to effective regulatory actions supported by accurate and rapid detection of Rf, which has been enabled by a method we developed and published. 2. Improved capability of identifying and detecting Phytophthora: Few pathogen groups can claim the notoriety of the genus Phytophthora, which includes old nemeses like P. infestans and P. capsici that continuously threat agricultural systems, and recently emerged novel pathogens of global concern, such as P. ramorum and P. kernoviae. Due in large part to increased surveys of agricultural and natural ecosystems in recent years, many novel species, including those that appear to be an interspecies hybrid, have been discovered. However, despite this advancement, the large estimated diversity of Phytophthora (200-600 species) underscores that our understanding of its ecology and diversity in nature is still limited. If history is a guide, some of the novel species will emerge as a threat to crop production and/or the environment. To effectively support rapid and accurate identification of pathogenic species, a key step for disease management, we cannot overemphasize the importance of cataloging cultures and associated data that represent the known diversity as references in a readily accessible format. Because Phytophthora pathogens pose a threat to agricultural and environmental systems globally, establishing a mechanism that facilitates international cooperation in documenting the diversity and dynamics of known and novel pathogens becomes extremely critical for mitigating their impact. To address these needs, Phytophthora Database (PD; http://www.phytophthoradb.org/) was developed. 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. This database now has more than 600 registered users from 50 different countries and has facilitated the identification and description of new species. On average, we recorded 1,500 visits to the database per month. The sequence data have also helped the development and validation of new molecular diagnostic tools for various Phytophthora species.
Lessons Learned:	Some pathogens (e.g., Xanthomonas species associated with bacterial spot of tomato and pepper) are consistently introduced into Pennsylvania, while others show up time to time. Rosellinia needle blight was detected for the first time in Pennsylvania. The dynamic nature of pathogen movements underscores the importance of continuously monitoring the nature and 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 format so that these reference data can provide a critical insight into how pathogen communities are structured and change in the state. We will work with PDA again in 2014 to address both needs with the focus on Phytophthora.
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Additional Information:	ADDITIONAL INFORMATION 1. Publications and presentations: 1.1. Publications:

	1. Park, B., Martin, F., Geiser, D. M., Kim, H.-S., Mansfield, M. A., Nikolaeva, E., Park, S.-Y., Coffey, M. D., Russo, J., Kim, S. H., Abad, G., Burgess, T., Grünwald, N., K., Cheong, J., Choi, J., Lee, Y.-H., and Kang, S. (2013) Phytophthora Database 2.0: Update and future direction. Phytopathology 103: 1204-1208. 2. Nikolaeva, E., Kang, S., Olson, T., and Kim, S. H. (2012) Real-time PCR detection of Rhodococcus fascians and discovery of potential new host plants for R. fascians in Pennsylvania. Online. Plant Health Progress doi:10.1094/PHP-2012-0227-02-RS. 3. Kim, S. H., Nikolaeva, E., Olson, T. N. and Kang, S. (2012). Diversity of Phytophthora and Pythium in Pennsylvania forest streams. Phytopathology 102: S4.64 (Abstract). 4. Kang, S. (2012) Management of germplasm collections and associated data via informatics tools: Opportunities and challenges. Phytopathology 102: S4.166 (Abstract). 1.2. Presentations: Pennsylvania plant inspector training: Current information about Geosmithia sp., Cylindrocladium pseudonaviculatum, Rosellinia herpotrichoides, Phytophthora ramorum, and Puccinia horiana have been presented at inspector training sessions and also through frequent individual contacts. Presentation at the 2012 NEPDN (Westchester, NY): A method for rapid and accurate detection of Rhodococcus fascians was presented. Presentation at the 2012 American Phytopathological Society meeting (August 4-8, 2012; Providence, RI): The organization and utility of Phytophthora Database was presented to ~50 people. Presentation at the 4th International Workshop on Oomycete: Phytophthora, Pythium, and Phytopythium (May 21-25, 2012; University Maryland, MD): A presentation on how to use Phytophthora Database for detecting, monitoring, and managing Phytophthora (40 min talk). Approximately 40 people attended this workshop.

Project Title:	**Microbial Survey of Pennsylvania Surface Water Testing, Project 7**
Project Summary:	In recent years, an increasing number of outbreaks of foodborne illnesses have been linked to consumption of fresh fruit and vegetables. Although contamination of fresh produce can happen at any point in the pre- and post-harvest farm environment, the microbial safety of irrigation water is a source of particular concern because its microbial content can vary widely. Rivers, creeks, streams, ponds, and lakes used to obtain irrigation water have shown to be sources of human pathogens including *Salmonella* spp. and *E. coli* O157:H7. With the passage of the Food Safety Modernization Act in 2011, the U.S. Food and Drug Association has been charged to develop farm food safety regulations designed to minimize opportunities for contamination of fresh produce as it is grown, harvested, and handled. New standards for the microbial safety of agricultural water that is intended to, or likely to, contact the harvestable part of the crop have been proposed and will be finalized by October 2015. Water standards in the draft regulation include microbial limits for *E. coli* and *Enterococci* bacteria along with required testing schedules. Water standards in the draft regulation include a maximum allowable level (geometric mean) for *E. coli* of 126 CFU or MPN / 100 ml water.
Project Approach:	The purpose of this project was to evaluate 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 was accomplished by conducting a 2 year microbial survey of surface water sources in in south central and southeastern Pennsylvania

	used for produce irrigation. We attempted to determine the impact of proposed FDA microbial standards for agricultural water and if chemical or physical factors could predict E. *coli* or pathogen levels. We also developed a mail-in GAP water sampling kit that growers can use for *E. coli* testing at the Penn State Agricultural Analytical Laboratory. **The following is a summary of tasks and activities performed during the entire grant period.** A total of 153 water samples were taken over a 2 year period from 39 farms located in the Susquehanna and Delaware watersheds in southeastern Pennsylvania. Levels of microorganisms used to indicate fecal contamination varied widely among farms and sampling periods. Chemical and physical characteristics of water and rainfall data were not useful for predicting fecal indicator levels. Although no predictive relationships were observed between fecal indicator organisms and the presence of human pathogens, most farm surface water sources would not meet EPA recreational water standards for *E. coli* and *Enterococcus* currently proposed in FDA produce safety standards. Among water sources tested 3 times in 2010 and 2011, 73 and 84%, respectively, had seasonal mean *E. coli* levels greater than the 126/100 ml limit in FDA's proposed produce safety standards under the Food Safety Modernization Act of 2011. A mail-in water sampling kit was developed in 2014 season and made available to Penn State horticulture and water quality Extension educators or the Penn State Agriculture Analytical Laboratory for distribution. In 2014, 39 growers submitted samples for *E. coli* testing. Counts per 100 ml ranged from non-detectable to 461 with an average value of 35 CFU/ 100 ml. Only 3 samples (7.6%) were above the EPA *E. coli* limit of 126 CFU/100 ml. **Conclusions and recommendations for Pennsylvania produce growers:** FDA's adoption of EPA recreational water standards for *E. coli* and *Enterococci* in agricultural water seems unreasonable and will impose an unnecessary burden on produce growers who use surface water for direct contact (overhead spray) irrigation, preparation of chemical crop sprays, or for frost control. A strategy growers could use to minimize this burden would be to use drip irrigation methods which would prevent direct contact of non-compliant surface water with the harvestable part of the crop. Our data show a significant proportion of farms were already using this method. Because drip irrigation lowers food safety risks and eliminates a regulatory burden, this practice should be encouraged. However non-compliant water used for chemical crop sprays or frost control remains an important issue because it would require disinfection treatments to lower *E. coli* populations to acceptable levels before it could be used.
Goals and Outcomes Achieved:	Results from this project are presented in two sections; 1) the microbial survey and 2) development of the water sampling kit. 1) Microbial survey study Methods: Sample collection. Surface water sites were identified through a follow up survey taken after a 2009 Penn State Extension Good Agricultural Practices (GAP) workshop. The sampling frequency was selected based on the recommendation in the USDA Agricultural Marketing Service (AMS) auditor training manual (USDA 2007) that

surface water samples be taken at the beginning, middle, and end of the growing season.

Briefly, 1-liter samples were collected in sterilized HDPE bottles (Nalgene, Rochester, NY, USA) affixed to a 3-meter long sampling pole (WhirlPak, Fort Atkinson, WI, USA). The pole was modified so that the collection bottle could be inverted during sampling, thus allowing for the collection of water at approximately the same water depth as the irrigation water intake source. The samples were then placed in a portable electric cooler (Koolatron, Brantford, ON, Canada) at 4°C for transportation by automobile to the Pennsylvania State University – Berks Campus food microbiology laboratory within 6 hours of sampling. Samples were analyzed immediately upon arrival at the laboratory.

Chemical and physical analysis. Water temperature was measured at the collection site. pH, conductivity, and turbidity were measured immediately upon arrival at the laboratory. pH values were determined using a Model SevenEasy S20 pH meter (Mettler Toledo, Columbus, OH, USA). Conductivity was measured using a YSI Environmental Conductivity Meter (YSI Incorporated, Yellow Springs, OH, USA). Turbidity was measured using a HACH 2011P Turbidimeter (HACH Lange, Dusseldorf, Germany).

Weather data collection. Precipitation and air temperature data were collected from Automated Surface Observation Systems (ASOS) sites archived on the Weather Underground web site (www.wunderground.com). Data for total rainfall on the day of sampling and the 3-day accumulated total prior to sampling were collected from the closest weather station to each sampling location as determined by entry of zip code and sampling date into the database.

Microbial analysis. Samples were analyzed for total plate count (TPC), Enterobacteriaceae, coliforms, fecal coliforms, *E. coli*, and *Enterococci* according to procedures in the Bacteriological Analytical Manual (BAM; FDA 2002b). Aerobic Plate Count Petrifilm™ (APC Petrifilm™, 3M, St. Paul, MN, USA) was used for TPC determinations using an incubation period of 24 hours at 37°C. Enterobacteriaceae were enumerated on Enterobacteriaceae Petrifilm™ (3M) and incubated at 37°C for 24 hours. Coliform and E. *coli* were enumerated simultaneously on E. *coli*/Coliform Petrifilm™ (3M), which was incubated for 24 hours at 37°C. Fecal coliforms were enumerated using Coliform Petrifilm™ (3M) held in a humidified incubator at 42°C for 24 hours. All samples were plated in duplicate. Enterococci were enumerated by direct plating on KF streptococcus agar (BD) supplemented with 1% Triphenyl Tetrazolium Chloride (TTC; BD) or alternatively by filtering 10 and 100 mL through a sterile 47 mm cellulose membrane (0.45µm, PALL, Port Washington, NY, USA) and then placing the filter on KF streptococcus agar as described. Samples were filtered and plated in duplicate. Pathogens were enumerated using standard methods for enumeration of *E. coli* O157:H7 and *Salmonella* spp. in water. Presumptive positive colonies were streaked onto nutrient agar and stored at -80C for subsequent confirmation using standard polymerase chain reaction (PCR) procedures.

Statistical Analysis. Descriptive statistics (mean, standard deviation, median) for each microbial indicator organism were determined using Microsoft Excel 2007 (Microsoft Corporation, Redmond, Washington). Pearson correlation coefficients were determined using the Statistical Analysis Software (SAS) system (Version 9.3 SAS Institute Inc, CARY, NC, USA) to describe the relationship among microbial indicator organisms and between indicators and physical, chemical and weather data.

RESULTS

Number of samples. A total of 153 water samples were taken over a 2 year period (2010 and 2011) from 39 farms located in the Susquehanna and Delaware watersheds in southeastern Pennsylvania. Our initial goal was to obtain 3 samples at each farm at approximately equally spaced time intervals from June through August of subsequent years; however, the number of samples taken from each farm varied due to growers electing not to participate in the middle or between seasons or lack of flow in some creeks and springs.

Irrigation methods and crop types. Among farms sampled, 56.4% used only drip irrigation, 23.1% used only overhead methods, and 20.5% used both methods. Ponds were the most frequently sampled surface water source (35.9%), followed by creeks (33.4%), rivers (17.9%), streams (5.1%), and lakes (2.6%). Two sites (5.1%) were open wells. As is typical of produce farms in Pennsylvania, most (64.1%) grew more than one crop. Crops grown at sampled farms included winter squash and pumpkins (14.6%), sweet corn (13.1%), tomatoes (13.1%), potatoes (11.5%), root crops (onions, carrots, radishes) (9.9%), cucumbers (6.2%), peppers (6.2%), tree fruit (6.2%), and Cole crops (broccoli, cauliflower) (5.3%). Less commonly grown were leafy greens (3.1%), melons (3.1%), and summer squash (3.1%), followed by green beans (1.5%).

Microbial levels in water samples. Description statistics for total aerobic plate count (TPC), total coliforms (TC), fecal coliforms (FC), *E. coli* (EC), Enterobacteriaceae (ENTB), and Enterococci (ENTC) for samples taken in years 1 and 2 are shown in Table 1. Populations for each microbial indicator type were highly variable within each year as evidenced by large differences between minimum and maximum values and high standard deviations relative to means. Mean values for TPC, TC, FC, and ENTB populations were significantly ($P \leq 0.05$) higher in year 2 compared to year 1. For each year, the type of water source and the time during the growing season during which sampling took place did not have a significant (P>0.05) effect on any of the mean indicator populations. For both years, all of the samples were positive for aerobic bacteria and more than 90% contained detectable levels of Enterobacteriaceae and Enterococci. In years 1 and 2 respectively, coliforms (72 and 78%) and fecal coliforms (74 and 75%) occurred with approximately equal frequency indicating a very low occurrence of non-fecal types. *E. coli* was detected in 57 and 63% of samples during in each respective year and varied widely as shown in Figure 1.

Chemical and physical characteristics of water samples and rainfall data. Results are shown in Table 2. Similar to the microbiological results, there was great variability in the data which likely is a reflection of the diversity of water sources sampled over a wide geographic area. No significant differences ($P > 0.05$) in mean values occurred between years 1 and 2 for pH, conductivity, and water temperature. However, mean values for turbidity, air temperature, and rainfall on the day of sampling and the 3-day accumulation prior to sampling were significantly ($P \leq 0.05$) lower in year 2. Only the rainfall data showed median values relatively low compared to mean values, perhaps due to infrequent, but high volume, rain events.

Correlations .Correlations between each of the microbial indicators and sample chemical and physical characteristics and rainfall data were poor ($-0.3759 \leq r \leq 0.1823$) with high *P* values (Table 3). Although pH versus each indicator group, except for ENTC, was significant at $P < 0.0003$, the low correlation coefficients ($-0.2915 \leq r \leq -0.3759$) do not support a predictive relationship with microbial indicators.

Impact of agricultural water microbial levels on farms. In 2010 (N=94) and 2011 (N=59), the proportion of

samples exceeding 1986 EPA recreational water standards single sample limit of 235 CFU *E. coli* /100 ml was 51.1 and 55.9%, respectively. Based on these results, 72.7 and 81.0% of the farms tested during the 2 year study would have had at least one sample greater than this limit.

Among the 36 farms tested more than once in 2010 and 2011 for *E. coli*, 83.3% would have failed a 2-yr 1986 or 2012 EPA recreational water standards *E. coli* geometric mean limit of 126 CFU/100 ml. Among the same 36 farms, 50.0% would have failed the 2-yr geometric 2012 EPA geometric mean limit of 30 Enterococci CFU/100 ml.

Over the course of the 2-year study, no E. *coli* O156:H7 was found and there were only 5 instances of confirmed *Salmonella* contamination. One was collected from a pond on an organic farm where a chicken house was located adjacent to the water source, and two samples were collected from two plain sect farms where in both cases cattle and horses had free access to the water sources. Two samples were obtained from a pond located on a conventional farm where the water source was located adjacent to a highway. However, there were not enough pathogens found over the course of this study to determine if there are any meaningful predictive correlations with indicator organisms or chemical and physical factors.

Conclusions and implications for Pennsylvania produce growers: Levels of microorganisms used to indicate fecal contamination varied widely among farms and sampling periods. Chemical and physical characteristics of water and rainfall data were not useful for predicting fecal indicator levels. Most farm surface water sources would not meet EPA recreational water standards for *E. coli* and *Enterococcus* currently proposed in FDA produce safety standards. Because no predictive relationships between these indicators and the presence of human pathogens, FDA's adoption of EPA recreational water standards for *E. coli* and *Enterococci* in agricultural water seems unreasonable and will impose an unnecessary burden on produce growers who use surface water for direct contact (overhead spray) irrigation, preparation of chemical crop sprays, or for frost control. A strategy growers could use to minimize this burden would be to use drip irrigation methods which would prevent direct contact of non-compliant surface water with the harvestable part of the crop. Our data show a significant proportion of farms were already using this method. Because drip irrigation lowers food safety risks and eliminates a regulatory burden, this practice should be encouraged. However non-compliant water used for chemical crop sprays or frost control remains an important issue because it would require disinfection treatments to lower *E. coli* populations to acceptable levels before it could be used.

2) Development of a water sampling kit.

Because shipment of water samples through the mail may expose them to temperatures that may cause microbial levels to change, it is important to understand what temperatures changes might occur during shipping and what sample conditions at the time of mailing would minimize temperature changes.

Methods:

To determine effects of temperature abuse on changes in sample microbial levels, surface water samples were collected from five sources in Centre County, Pennsylvania. Two samples were collected from the Penn State analytical research farm at Rock Springs, one from Shavers Creek Penn State environmental research facility, and two from two commercial farms in Julian and Centre Hall, PA. One-liter grab samples were collected in

	sterilized HDPE bottles (Ben Meadows, Janesville, WI, USA) using the modified sampling pole previously described. Samples were transported at 4°C in a portable electric cooler (Koolatron, Brantford, ON, Canada) to the laboratory. Each sample was equally divided into five sterilized 250-mL glass bottles (VWR, Radnor, PA, USA) and held in a water bath at 4, 10, 21, 30, and 39°C (the maximum temperature reached during the mailing study). Microbial levels were determined before and after each treatment. In order to determine possible changes in test samples during shipping, water testing kits consisting of a 250 mL HDPE water sampling bottle (2¼x4"), bubble wrap, and mailing box (4¼x4¼x10½") were obtained from the Penn State Agricultural Analytical Laboratory (University Park, PA, USA). Water was collected at the Tulplehocken River in Wyomissing, PA. To each filled bottle, a temperature data logger (HOBO Pendant Temperature Data Logger, Onset, Pocasset, MA, USA) was added. One water sample was wrapped in plastic bubble wrap and placed in the mailing box, while the second water sample was wrapped in a flexible gel ice blanket (8½x11"; Cryopak, Edison, NJ, USA) at -18°C, covered in bubble wrap and placed into a mailing box. Both boxes were sealed with mailing tape and sent via U.S. Postal Service express mail to the Food Science Building at The Pennsylvania State University, University Park, PA. Data loggers were retrieved from the samples after 30 hours and data offloaded using HOBOware Lite Software (Onset, Pocasset, MA, USA). Outdoor temperature data for Wyomissing, PA and State College, PA were accessed from Weather Underground (www.wunderground.com). Results: Mailing study. All samples reached an approximate equilibrium with external temperatures during shipping. The warmest temperatures experienced during mailing was 39°C. After holding samples at 4, 10, 21, 30, and 39°C, total plate count, coliform, fecal coliform, *E. coli*, and *enterococci* levels were determined within one hour of sample collection, and 6, 18, and 30 hours thereafter. There were no significant differences in indicator population for samples held at or below 10°C. At higher temperatures significant increases occurred in total plate count and fecal coliform populations. Among sample test kits prepared, the best option for maintaining sample temperatures below 10°C was to use an 8x6x4¼" Styrofoam mailing kit packed with 2 15-oz ice bricks when packages. This worked well when external temperatures were at 25°C, but not 39°C. Conclusions and implications for Pennsylvania produce growers. The best packing option for transporting samples is an 8x6x4¼" Styrofoam mailing kit containing two 15-oz ice bricks. It should be labeled "Keep Package Cold". A temperature history indicator strip should be placed on the outside of the bottle determine if temperatures exceeded 10°C during mailing. Alternatively, the laboratory should measure sample temperature upon receipt and include that information in the lab report. If the sample temperature exceeds 10°C, the grower may wish to submit a new sample. The kit should contain written directions for growers on sample collection and handling practices, and a sample submission form that directs the analytical laboratory to determine generic E. *coli* levels.
Beneficiaries:	The beneficiaries of this project are produce growers in Pennsylvania and beyond who need guidance on

	implementation of the FDA Produce Standards required under the Food Safety Modernization Act (FSMA), as well as from wholesale buyers who have already demanded GAP compliance as a condition of sale. The results of this study show that many growers who use surface water for direct application onto their crops may need to make changes to their practices. This study has alerted us to this problem and we intend to focus further research in this area. Many comments to FDA on their draft produce safety standards express objection to the lack of science based evidence that *E. coli* levels can be used to predict the safety of agricultural water. The results of this project have and will continue to contribute to this discussion. As the final regulation is released in October of 2015, we can expect continued demand for knowledge on water testing, alternatives to direct contact irrigation methods, and disinfection methods. In April of 2014, a GAP water testing kit was created in collaboration with John Spargo, Director, Agricultural Analytical Services Lab and Bryan Swistock, Extension Associate, Water Resources Coordinator. The kit, which is currently distributed by Penn State Extension offices, consists of a shipping box with an insulated liner, a sterile sample bottle, two ice-packs, detailed sampling instructions, and a submission form. A description of the Penn State GAP Water Testing program and a water sample submission form is available at http://agsci.psu.edu/aasl/water-testing/farm-food-safety-gap-water-testing. In 2014, 39 growers have submitted water samples to the Penn State Analytical Laboratory. Approximately 1000 brochures describing the Penn State GAP water testing program were distribute to stakeholders since they were printed in spring of 2014. Penn State Extension water quality educators are available statewide to provide valuable assistance to growers on sample taking procedures and interpretation of results. We continue to bring the results of our research to stakeholders at regularly offered GAP workshops and speaking presentations. Between 2010 and 2014, Penn State Extension reached 1,101 growers at 31 1-day“Keeping Fresh Produce Safety Using Good Agricultural Practices” workshops held around the state. As data from this project was generated, the results of our research were presented within the Water Safety module. The results were also presented in a new GAP course titled “How to write a Harmonized GAP food safety plan” which has been held 4 times since 2013 to 106 growers. A webinar titled “Water Standards and Testing Requirements under the Food Safety Modernization Act” was held on April 30, 2014 and as of 7/15/2014 was viewed by 108 individuals. In 2013, Dr. LaBorde provided expert testimony to members of the State House and Senate Agriculture and Rural Affairs committees on the anticipated impact of the Food Safety Modernization Act (FSMA); including the anticipated regulations on agricultural water. Using the results from this study, I contributed to 2 Pennsylvania Department of Agricultural review sessions after the release of the first and second produce safety standards drafts.
Lessons Learned:	We occasionally encountered problems getting access to farms repeatedly over the season and over the 2 years. Nevertheless when some farms dropped out of the survey, we were able to find others and thus generated much useful data. Our plan to schedule pick up dates for water samples and get them to the lab quickly was complicated. Perhaps for future projects, we will select fewer farms and sample much more frequently. We look forward to continuing studies on the microbial safety of agricultural water especially that which is obtained from surface water sources.

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:	Visit the Penn State Farm Food Safety at http://extension.psu.edu/food/safety/farm for updates on the latest GAP research and training opportunities from Penn State Extension.

Project Title:	**Eliminating Food Deserts through the use of High Tunnels, Project 8**
Project Summary:	The initial purpose of the project in Philadelphia was to continue to build on our previous USDA SGBG project, which the purpose was to demonstrate the production of locally available vegetables through the use of high tunnels and help eliminate the food deserts that existed in the city. The importance and timeliness of project is right on the cutting edge of food security and availability of good and nutritious vegetables to help combat the poor nutrition of the underserved communities in the city of Philadelphia. This project allowed us to further construct additional high tunnels to further demonstrate the production of vegetables even year around to other farmers and producers in the City of Philadelphia. Under this project our partners and we were able to finish construction on four high tunnels at various locations in the City of Philadelphia and are in the process of finishing two more high tunnels. Our partners were Bartram's Garden; Heritage Farm; SHARE' Food Program's Nice Roots Farm; Guild House West, and Urban Tree Connection. Working with our partners we constructed a 21 by 60 foot high tunnel at SHARE' Food Program's Nice Roots Farm; two 21 by 96 foot high tunnels at Heritage Farms; a 21 by 80 foot high tunnel at Urban Tree Connections farm. We are in the process of finishing a 21 by 60 foot high tunnel at Guild House West and a 30 by 48 foot high tunnel at Bartram Gardens.
Project Approach:	We worked closely with our partners to help them select the crops that could grow successfully in the high tunnels. This involved both three season and four-season production and varied from location to location depending on the population and distribution network. Three-season production entailed recommending cool season crops such as greens, broccoli, cabbage in the spring and fall and warm season crops tomatoes, peppers, eggplant in the summer months. Four season production entailed recommending crops such as hardy greens, collards and root crops that could survive the winter months with some additional protection afforded by a row cover etc. and could then be harvested all winter long. The extension team in Philadelphia (the boots on the ground) continued to work with the high tunnel producers to answer their questions and help them with identifying pests and diseases plan for future crops keeping in mind that these personal visits were an ongoing part of the project. We didn't organize a formal meeting of all the high tunnel producers but keep in touch via e-mail with the producers and thus they were able to express their needs and concerns and observations. We have had a good amount of media attention throughout the previous and this project as well as interest from the Mayor's Office of Sustainability and other department heads in the city and representatives of the state government. The employment part-time of Tommy McCann located in the Philadelphia County Extension office was instrumental in assisting with the construction of the high tunnels along with myself and our partners. It was necessary to stay in Philadelphia in order to construct the high tunnels and to travel back and forth from Penn State. We were on a continual dialogue with our partners in person visits and via e-mail.
Goals and Outcomes	The project was extended until September 30, 2013. This will complete two Specialty Block Grants on the use of high tunnels in Philadelphia. The results of the efforts of our partners and us have been great (it is hard to

Achieved:	put a number figure on the number trained and impacted by the project but I would anticipate 100 persons trained by ourselves and our partners and over a (conservative number) 2,000 reached by our project. High tunnels continue to be constructed around the city with assistance from our partners, Penn State University and personnel from the Philadelphia County Cooperative Extension Office. The work has served as a model for other large urban centers. In addition, our partners have spoken at the Mid-Atlantic Fruit and Vegetable Conference, a large grower meeting held each year in Hershey, Pa on the production of vegetables in the City of Philadelphia to an audience that numbered 170. It was a great way to showcase the partnerships and the positive results of the USDA Specialty Crops Block Grant funding available through the Pennsylvania Department of Agriculture. We know from talking to our partners that the high tunnels are definitely a positive addition to their farming operations. There have been several additional high tunnels put up in the City that were a result of seeing the success that our partners had with their high tunnels. I feel that we achieve what we set out to do and we will continue to nurture the growth of high tunnels in the City of Philadelphia.
Beneficiaries:	Certainly our partners, SHARE Food Program's Nice Roots Farm, Heritage Farms, Guild House West Assisted Living Center, Urban Tree Connections, and Bartram's Gardens benefited from the high tunnels for food production as well as the expertise brought to the project by Penn State University personnel. The local communities served by these partners benefited from the availability of locally produced fresh vegetables even year around for cool season crops such as collards, kale, salad greens and root crops. The school age youth benefited from programs originating from the partners high tunnels highlighting the science behind the production of vegetables and why fresh vegetables are so important to their health. The project has had so many positive spin offs that will continue to grow and expand in the future. The number of consumers benefitting from this project based on numbers from our partners is in excess of 5,000 persons, The number of specialty crop producers or potential producers around 75, and the City of Philadelphia both governmental agencies and private citizens that learned food can be produced even year around and benefited from having locally available food in underserved communities.
Lessons Learned:	The biggest lesson learned is that when you begin a project in the urban environment you need to have a big table to host meetings. The number of players involved in a project like this is tremendous and Penn State University is only one player. There are other non-profit organizations, other institutions of higher education in the city, city government officials and departments, secondary educational institutions, community organizations, and politicians both local and state. It was a wonderful experience that yielded real tangible results and change lives for the better. Watching the growing of fresh vegetables and then encouraging good nutrition in local communities was a real positive outcome. Eat well-live well.
Contact Person:	Dr. William James Lamont Jr. 814-865-7118 E-mail: wlamont@psu.edu
Project Title:	**Farm Direct Market Campaign for Pennsylvania Apples, Project 10**
Project Summary:	Based on the success of the previous two years, the "Find Fresh" ad campaign promoting Pennsylvania Farm Markets was extended even further with additional online advertising, outdoor advertising and increased radio ad frequency. The two main objectives of this campaign were to promote consumer awareness of Pennsylvania Farm Markets and to promote Pennsylvania Apples and apple products along with other PA Preferred Crops. 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. Using the "Find Fresh" concept that was developed for the

pilot campaign, Using various mediums, we capitalized on the "Buy Local" trend and encouraged consumers to find the freshest produce possible; from their local growers.

Project Approach:

The campaign succeeded in covering 91% of the state using radio and outdoor media, and 100% of the state with online advertising. In planning the media campaign focus on the location of Pennsylvania Farm Markets was emphasized. Locations determined radio coverage and the positioning of billboards in relation to proximity nearby farm markets.

Email Database

The Pennsylvania Apple Marketing Program (PAMP) created an email distribution list using iContact.com and encouraged grower members to add their email addresses to the database. An e-blast letterhead template was developed to use for news and announcements. In addition, a quarterly electronic newsletter was created to bridge the gap between our regular printed newsletters, increasing the communications to our grower members.

The database reached 150 addresses. With 272 members, this would appear to be over half; however, we have found that there are multiple subscribers from some member farms, thereby reducing the total number of farms represented.

Media Campaign

The media campaign began in early September as scheduled. In addition, the Pennsylvania Apple Marketing Program's public relations program supported the launch of radio and online advertising with an early season press release, radio interviews, and newspaper interviews with PAMP's then Executive Director.

Website Improvements/Mobile Website

A mobile version of PennsylvaniaApples.org was created to help consumers "Find Fresh" on the go. It was optimized to make the "Where to Buy" section easy to access and navigate. Additionally, a self-managed profile section was created for growers to register and manage their own Farm Market profiles.

Goals and Outcomes Achieved:

In most cases, all efforts lead to improved metrics.

Over the final twelve months of the campaign website saw improved analytics:

- Apple Minutes videos received 421 views on YouTube
- 93% of listed farm markets had referral traffic to their own sites from PennsylvaniaApples.org
- Website visits increased 13% over 2011
- Mobile visits increased 138%
- 63% of farm markets have updated their market profiles

Y/Y Comparison (2011-2012)

Month	Visits	New Visitors
September 2011	12,115	5,159
October 2011	11,110	5,857
September 2012	12,298	6,882
October 2012	13,776	6,583

The above table represents a 22% Y/Y increase in new visitors.

Additionally, website visits spiked dramatically in conjunction with PR and media campaigns.

- New visitors accounted for 43% of website visits
- New visitors accounted for 24% of the mobile visits
- Where To Buy searches increased 120% over 2011

Beneficiaries:

The beneficiaries of this project were the 272 grower members that are part of the PAMP program. Because this campaign focused on "Find Fresh" and farm markets, it increased awareness not only for the PA apple

	industry, but for other specialty crops as well. The "Find Fresh" campaign directed consumers to a specific URL on PennsylvaniaApples.org (navigation has since changed so specific URL is no longer available), which help consumers find apple growers by product, location, name, etc. Because many elements of the campaign were educational in nature, consumers were also the beneficiaries of the campaign as it increased their awareness of the benefits of the health benefits of eating PA apples as well as the economic impact.
Lessons Learned:	At the Pennsylvania Apple Marketing Program's July board meeting, the Board advised the ad agency to move up the timing of the campaign based on the early harvest of the apple crop in Pennsylvania. The entire media campaign was moved forward to begin in Early September, continuing through October. It appears the timing adjustment both made sense and was successful.
Contact Person:	Julie Bancroft 717.783.5418 Julie@PennsylvaniaApples.org
Additional Information:	Two presentations with campaign metrics which were prepared by the contracted agency who worked on this campaign have been provided in hard copy. These reports further substantiate the programs effectiveness: 1) PPO&S Marketing Communications Report – November 2012 2) PPO&S Public Relations Recap Report – August 2011 – May 2012 These reports are available at The Pennsylvania Department of Agriculture upon request.

Project Title:	**Pennsylvania Fruit Tree Improvement Program Harmonization Project, Project 11**
Project Summary:	The propagation of fruit trees is a high risk pathway for the movement of plant viruses which can spread rapidly during the production of nursery stock. While some viruses are known to have a minor impact on infected trees, others can cause very serious diseases such as Plum Pox. Economic impacts of viruses include delayed maturity, increased agricultural inputs, reduced growth and yield, poor fruit quality, graft incompatibility, and tree mortality. The Pennsylvania Fruit Tree Improvement Program (FTIP) is a voluntary virus-tested certification program for fruit tree nursery stock (both fruit-bearing and ornamental) of the species Prunus (stone fruit), Malus (apple), Pyrus (pear), Chaenomeles (flowering quince) and Cydonia (quince). The Pennsylvania Fruit Tree Improvement Program Harmonization Project has at its core the PA FTIP regulation currently on the books, but also incorporated the continuation of efforts that were initiated four years ago. In 2009, the Pennsylvania Department of Agriculture took the lead in establishing a working group through the National Clean Plant Network-Fruit Trees Group (NCPN-FT), and spearheading work on a harmonized state level model regulatory standard for virus-tested fruit tree nursery stock production systems. The Fruit Tree Certification Working Group of the NCPN-FT consists of representatives from state departments of agriculture, USDA-APHIS, the Canadian Food Inspection Agency, clean plant centers, universities, and the nursery industry. All of the fruit tree virus-certification programs in existence, including those of 11 states and Canada, were examined for strengths and weaknesses. Generally, these certification programs are based upon the propagation of trees from material that has originally tested negative of all detectable viruses, combined with independent management components such as isolation distances, vector control, virus-testing, and field inspection. However, each program contained differences from other programs that ranged from minor to extensive, illustrating the need for a harmonized standard. Using the best available science regarding viruses

	and management practices, and relying on collaboration in cooperative partnerships with regulators and nurseries, the working group constructed multiple drafts of the main body of a harmonized regulation. A polished final product was posted on the National Clean Plant Network-Fruit Trees website (http://ncpn-ft.org) in October, 2012. With the proposed harmonized regulation in a workable form, it was time to attempt to apply it. In 2012 and 2013, the Pennsylvania Fruit Tree Improvement Program Harmonization Project assessed and updated Pennsylvania's current virus-tested regulation, enhancing nursery production practices for clean apple, pear and stone fruit trees. These trees are supplied to fruit growers, ensuring that they have healthy trees that produce competitive crop yields with lower lifetime input costs; and to the amateur backyard fruit tree enthusiast making certain that their trees have a long life and aren't reservoirs for disease that could spread to neighboring growers or natural habitat. Education and outreach promoting the planting of clean stock, a previously underdeveloped arm of the project, was also more fully realized during the PA FTIP Harmonization project.
Project Approach:	Over the course of this SCBG period, the PA FTIP Harmonization Project was successful in completing the goal of significantly updating, strengthening and harmonizing the PA FTIP during this reporting period. The effort to harmonize all state-level fruit tree virus certification programs on a national level has also made considerable strides. The same format used to present work plan activities in the proposal has been used here to aid in the demonstration of progress and task completion: **January, 2012** • Sarah Gettys met with Boyer Nurseries and Orchards, Inc. and Adams County Nursery, Inc during multiple face-to-face sessions to assist them in developing inaugural Pest Management Manuals for both businesses. The Pest Management Manual serves as an outline of best management practices and standard operating procedures that the nurseries employ to reduce the transmission of viruses through their nursery stock production system. • The annual PA FTIP Advisory Committee meeting was held in Biglerville at the Penn State Fruit Research and Extension Center. Results from the 2011 field sampling season were presented to the two participating nurseries in written reports as well as PowerPoint presentations; emergent disease issues were also discussed. The nurseries took the opportunity to voice questions and concerns, including the requirement of the PA FTIP to fumigate land prior to its use in nursery production. Fumigation has become progressively more difficult to accomplish, and this issue has become one of the most important considerations in the harmonized standards. **February, 2012** • Sarah Gettys continued development of the appendices for the harmonized regulatory standard based on findings from the 2011 testing season, discussions with colleagues in other state virus certification programs, and interaction with the two participating nurseries. **March, 2012** • Sarah Gettys and Ruth Welliver organized a meeting of the *National Clean Plant Network - Fruit Trees* (NCPN-FT) Certification Working Group that was held on March 13 and 14 in Prosser, Washington. During this meeting, a final draft of the main body of the national harmonized standard was reviewed and discussed. The group decided that after making several small changes, the official posting of the final draft could be voted upon. The vote tally of 11 "yes", and 1 "no" allowed the final version of the

standard to be posted on the NCPN-FT website (http://ncpn-ft.org/) in October, 2012. The format and content of several of the appendices were also discussed and suggested changes were recorded by Sarah.

- The first-ever audits of the shipping and tracking systems of the two participating nurseries were conducted in late March by Sarah Gettys. Audit findings were collected using the draft forms in the harmonized national standard "Appendix 14 - Audit Checklists and Forms." Shortcomings of the draft forms were noted for further development and refinement. A great deal of valuable information on nursery production and tracking systems was gathered during conversations between Sarah and the nursery personnel that would not fit in a form but was noted nonetheless.

April, 2012

- Preparations for the 2012 field season were made by Ruth Welliver and Sarah Gettys. These included ordering supplies for the ELISA/PCR laboratory, stocking field vehicles, printing sampling tags, and hiring seasonal laboratory assistants.

May through November, 2012

- Field sampling and lab testing season began in May and continued through the beginning of November. Sarah Gettys coordinated and led field sampling and inspection, and Ruth and Sarah shared in coordinating laboratory time. Updates to the geospatial dataset and nursery mapping were made throughout the season. Two blocks of cherry budwood source trees that were previously untested for the four viruses of concern were newly surveyed. Over 4,000 samples of plant tissue were collected and tested for Plum Pox, P*runus* Necrotic Ringspot, Prune Dwarf and Tomato Ringspot viruses.

August, 2012

- A trip to nursery fields in Sussex County, Delaware to collect samples and inspect nursery stock grown there by one PA FTIP nursery occurred on August 7th and 8th. During this trip Sarah led a team of 5 seasonal Bureau of Plant Industry workers to collected samples of soil and weeds, as well as over 1,000 plant tissue composite samples. Nursery sites were mapped and field conditions inspected for compliance with virus-reducing best management practices.

October, 2012

- For the first time, several common budwood source sites located in Maryland were visited by the FTIP. These blocks are used by one of the program nurseries to collect budwood for production of Penn Standard certified fruit trees. The nursery annually collects samples, and the PDA tests these samples for the four viruses of concern. As an audit exercise, Ruth and Sarah chose several trees to locate and resample. The audit went extremely well and the chosen trees were easily located and sampled.

November and December, 2012

- Results from the 2012 field season were gathered, organized and analyzed by Ruth Welliver and Sarah Gettys. Reports were generated based on the findings. Please see the "2012 Fruit Tree Improvement Program Activity Summary" attached at the end of this report.

January, 2013

- Developed education and outreach materials, including a poster, a brochure and handouts with program specifics.

- Organized the 2013 meeting of the FTIP Advisory Committee in Biglerville, PA at the Penn State Fruit Research and Extension Center. Leadership from both participating nurseries attended, as well as PDA representatives Dana Rhodes (PA State Plant Health Official), Jackie Cooper and Judy Maurice (PDA Plant Inspectors), Ruth Welliver (PDA Plant Pathology Program Manager), Tammy Jones (PSU/PDA) and Sarah Gettys. Greg Krawczyk, Penn State tree fruit entomologist, was also in attendance and added information on current insect pest issues that affect the PA FTIP nurseries. Rob Crassweller, PSU Horticulture, participated via phone bridge. Results from the 2012 PA FTIP sampling and testing season were presented, as well as information of the 2012 Plum Pox Survey and recent cancellation of all remaining PPV quarantines. Dana Rhodes and Ruth Welliver led a discussion on compliance agreements and a current risk assessment on Light Brown Apple Moth. Tammy Jones gave a presentation on Peach-X disease and Pear Decline. An update on the National Clean Plant Network, the entity that ensures a supply of clean fruit tree propagation material to nurseries, was also given.

February and March, 2013

- The participating nurseries reviewed their Pest Management Manuals with Sarah as a required part of the "Annual Continuation of Participation and Notification of Changes" form (which was developed as part of the harmonization project).

- The second audit of the participating nurseries' production systems occurred, this year focusing on storage and shipping of finished virus-tested trees.

April, 2013

- The 2013 sampling and testing season was organized. Necessary supplies were ordered and three seasonal lab assistants were hired to conduct field and laboratory duties.

May through September, 2013

- Completed the 2013 field and laboratory season, and began to organize the resultant data. As described in the Goals and Outcomes section, testing and sampling in 2013 was expanded to cover more viruses and additional nursery blocks.

Throughout the Year

- A weakness pointed out in the 2012 Annual Report was remedied in the second half of the grant period - outreach efforts promoting virus-tested fruit tree nursery stock were significantly ramped-up. With outreach materials in hand, Sarah attended several events during the 2013 winter meeting season:

    - Pennsylvania Farm Show in Harrisburg, PA (January) - helped to staff the PA Invasive Species Council booth and spoke with several concerned citizens regarding ways to keep Plum Pox virus from returning to Pennsylvania, including buying virus-tested trees for their backyard orchards

    - The Mid-Atlantic Fruit and Vegetable Convention in Hershey, PA (February) - helped to staff the PDA PA Preferred/Specialty Crop Block Grant booth, using the opportunity to connect with

several personnel from the FTIP nurseries and growers who use their products, as well as distributing

- Adams County Winter Tree Fruit Educational Meeting (February), Biglerville, PA - between educational sessions Sarah was able to talk with three growers about the importance of using virus-tested stock to establish their orchards
- Pennsylvania Association of Sustainable Agriculture (PASA) "Farming for the Future Conference" (February), State College, PA - co-sponsored a booth with the PDA Pennsylvania Integrated Pest Management Program using this growing venue to educate over twenty interested individuals about what the FTIP does; Sarah also left 20 brochures on the public information table provided by the PASA organizers

Approximately 70 packets were distributed at the above events. An additional 40 brochures were distributed at the 2013 Pennsylvania Fruit Tree Improvement Program Advisory Committee meeting (January), Biglerville, PA, and the 2013 Pennsylvania Garden Expo (February), Harrisburg, PA. The FTIP Advisory Committee members, including the two participating nurseries, took the brochures to hand out in their offices.

- An unexpected and exciting development began in 2012 and continued into 2013. Working groups interested in harmonizing regulations dealing with the virus certification of other specialty crops within the NCPN (including small fruits, hops, citrus and grapes) have forged partnerships with the original fruit tree working group to build upon their experiences and compare methods and strategies for composing harmonized standards. Ruth and Sarah participated in a workshop supporting this cross-commodity harmonization effort was held in Davis, California on October 6th and 7th, and another held in Las Vegas in July, 2013. The most recent meeting in Las Vegas focused on defining the necessary core elements of a harmonized model standard for nursery certification of specialty crops, and tackled many of the same issues that the fruit tree group encountered, and in some cases, are still investigating.

Goals and Outcomes Achieved:

The FTIP Harmonization Project proposal and annual report introduced and updated the following measurable outcomes. As with the above "Work Approach" section, the same headings will be used again to demonstrate continuity of work accomplishments.

Finalized Draft of Harmonized Regulatory Standard and Appendices

- The writing and editing process for the full set of templates and guidance documents that support the implementation of the "State Level Model Regulatory Standard: Virus-Tested Certification Program for *Prunus*, *Malus*, *Pyrus*, *Chaenomeles*, and *Cydonia* Nursery Stock Production Systems" continued during the granting process. These fourteen appendices, each now in draft form, contain detailed information on best management practices, program requirements, and standard operation procedures for the harmonized standard. As the appendices are polished, they will be posted for public consumption to the National Clean Plant Network-Fruit Trees website (http://ncpn-ft.org), where they will join the finalized standard posted in October, 2012.

Production of Nursery-Specific Pest Management Manuals

- In 2012, the two participating PA FTIP nurseries (Adams County Nursery, Inc., and Boyer Nurseries and Orchards, Inc.) each produced Pest Management Manuals using the template laid out in Appendix 14 of

the harmonized regulatory standard. The partnership that formed between the nurseries and Sarah during the creation of these manuals made the experience an incredibly valuable one. The exchange of information that occurred during the writing of the manuals has been as important as the actual documents.

- In 2013, Sarah asked the nurseries to update the manuals with any changes made to their production practices described in the original manuals. Not only did this result in updated documents, it also served as a jumping off point for additional conversations between Sarah and the nurseries. Increasing discussion is one of the key components of the harmonized programs.

Pennsylvania's Participating FTIP Nurseries Certified in 2012 and 2013

- Pennsylvania's two participating nurseries were certified as having clean stock and the ability to develop clean production systems for new varieties to satisfy market demand. During the 2012 and 2013 growing seasons, the nurseries' stock was tested for the following four viruses: Plum Pox, Prunus Necrotic Ringspot, Prune Dwarf, and Tomato Ringspot. In both 2012 and 2013, more than 8,000 ELISA (Enzyme-linked Immunosorbent Assay) tests were run on leaf samples taken from FTIP-related source and nursery blocks. In addition, during the regular inspections of the FTIP-related blocks, more than 200 broadleaf weeds were collected and tested for Tomato Ringspot Virus through ELISA and bioassay. More than 30 soil samples were also inspected and tested for *Xiphinema sp* nematodes (Tomato Ringspot vectors). For more detail about testing, please see the attached report, "PA Fruit Tree Improvement Program 2012 Activity Summary."

- In 2013 ELISA testing was expanded to include a survey for additional viruses: Apple Chlorotic Leafspot, Apple Mosaic, Cherry Leafroll, Cherry Raspleaf, Peach Rosette Mosaic, and Tobacco Ringspot. This exciting expanded testing was not necessary to fulfill the current requirements for the PDA to certify the nurseries' stock as "Penn Standard" or "Penn Premium" under the PA FTIP regulation; however it gave the PDA and the nurseries a much better understanding of any new viral threats moving into the nurseries that may be considered under the strengthened program in the future.

Institution of Audit Component

- In March of 2012, both participating nurseries were audited for compliance with the harmonized regulations for the first time. This inaugural annual audit focused on the nursery stock production. Surveillance audits also occurred at times throughout the growing season during site inspections and sampling events. Audits of several previously unvisited sites in Maryland were also conducted.

- In February and March of 2013, the nurseries underwent their second annual audits, this time focusing on the tracking and shipping systems of each. Each nursery had to demonstrate that a randomly chosen order could be located in the computer system, and the source of the trees had to be traced through the entire production system.

Update and Enhance Mapping and Geospatial Database

- Using Geographic Information Systems (GIS) software, a geospatial data set has been produced and updated each growing season. The data includes the registered source blocks and nursery production blocks of both participating nurseries, and is used to generate maps which aid in several decision

	making processes required by the Pest Management Manuals, including buffer zone maintenance, block placement, and individual tree identification methods. These maps are also used by the FTIP field teams to navigate to the nursery blocks and plan sampling trips. Sites in the data set are located in Pennsylvania, Delaware and Maryland.
	
	Outreach and Education
	• The outreach and education component made limited progress during the spring and summer of 2012. However, during the winter of 2012/2013, outreach materials were developed by Sarah that promoted virus-tested clean fruit tree stock to nurseries, commercial fruit growers and backyard orchard hobbyists. Materials included a poster, table displays, and pamphlets presented at five large agriculture shows/meetings:
	  ○ Pennsylvania Farm Show in Harrisburg, PA (January)
	  ○ The Mid-Atlantic Fruit and Vegetable Convention in Hershey, PA (February)
	  ○ Adams County Winter Tree Fruit Educational Meeting in Biglerville, PA (February)
	  ○ Pennsylvania Association of Sustainable Agriculture (PASA) "Farming for the Future Conference" in State College, PA (February)
	  ○ 2013 Pennsylvania Garden Expo in Harrisburg, PA (February)
	
	During the 2013 FTIP Advisory Committee, brochures were also given to the two participating nurseries and to Penn State's Fruit Research and Extension Center to distribute to their clients.
	Generally, there are three tiers of interested parties: nurseries directly involved with the production of fruit trees, fruit growers, and the public at large. Nurseries (a relatively small fraction), and orchardists (the majority of those interested), were the focus of outreach efforts. Over 100 brochures were distributed, and direct conversation and communication with approximately 35 growers at the above meetings was recorded by Sarah. Additional people were reached by fruit grower Ben Wenk at the PASA conference during his presentation "Sustainable & IPM Tree Fruit for Profit." Sarah had contacted Ben about the possibility of mentioning the FTIP and virus-tested nursery stock in his presentation, and he was more than happy to do so. He also had a stack of brochures with him during the talk.
	Another outreach goal was publication of an article highlighting clean stock. Penn State's Integrated Pest Management newsletter and blog interviewed Sarah in January of 2012, and ran a story on the FTIP and the importance of using virus-tested trees. http://extension.psu.edu/ipm/news/2012/pennsylvania-fruit-tree-improvement-program-ensures-clean-trees.

Beneficiaries:	The FTIP Harmonization Project had several integral partners who did not receive direct funding from the SCBG, but benefitted from the project nonetheless. The two FTIP participating nurseries, Adams County Nursery, Inc. and Boyer Nurseries and Orchards, Inc., were the most immediate and active partners in the Pennsylvania FTIP Harmonization Project. Additional partners included the National Clean Plant Network and the Fruit Tree Virus Certification Working Group. All of these partnerships fostered an efficient exchange of scientific information, nursery best management practices/standard operating procedures, and editorial support for all documents produced through this project.

	During the FTIP Harmonization project, Adams County Nursery, Inc. and Boyer Nurseries and Orchards, Inc. continued to be able to position themselves as the foremost suppliers of clean nursery stock on the East Coast, while enhancing their best management practices and strengthening their overall participation in the FTIP. The Canadian fruit tree market also remained open, as Canada requires that any fruit tree nursery stock imported into the country must have been produced under a state virus certification program. Without the FTIP, no Pennsylvania fruit tree nurseries would have access to the Canadian market. Pennsylvania fruit growers and backyard orchard hobbyists also reaped the benefit of being able to buy an array of fruit trees from the virus-tested nurseries. Buying clean trees is a good way to protect the investment of starting an orchard, whether commercial or for personal enjoyment.
Lessons Learned:	The progress made during the PA FTIP Harmonization Project was steady, and the work plan timeline was appropriate for the vast majority of the activities set out in the proposal. The one goal that had not been fully realized in the original timeline (as discussed above) was a delay in the production and dissemination of an outreach packet. When writing the original proposal, it should have been anticipated that time during the field season (May through October) is often stretched thin, and the production of such outreach materials is an office-oriented job which is better suited to completion in the winter, after the growing/sampling season. The outreach component of the project was fully tackled during the winter of 2012/2013. The PDA has a much stronger Fruit Tree Improvement Program at the end of this granting period. Perhaps the most important outcome of this project is the communication and trust that was built between Sarah and the two participating nurseries. All of the goals and outcomes in this project were accomplished because of these enhanced relationships. It is difficult to quantify this outcome with numbers; however, at the start of the project, communication between the PDA and the nurseries was largely confined to the annual meeting of the FTIP Advisory Committee, and the occasional email to deliver virus results. At the end of this project, it has become common place for Sarah to receive emails and phone calls from both nurseries to ask for advice and direction regarding the FTIP, as well as other regulatory matters. Sarah was able to provide a map of one of the nursery's blocks for use by the nursery in a report they were putting together because a geospatial dataset had been created of their blocks (see "Update and Enhance Mapping and Geospatial Database" section of Goals and Outcomes Achieved). She was also able to build on her excellent relationships to coordinate an unanticipated and intensive sampling and testing regimen that arose in the spring of 2013 to solve an issue with shipments from one of the FTIP nursery's stock that was being held up for non-virus related phytosanitary issues. The SCBG funding allowed the chance for Sarah and the PDA to focus on improving and harmonizing the FTIP which in turn facilitated the building of these relationships.
Contact Person:	Sarah Gettys, Fruit Tree Certification Technician Department of Agriculture, Bureau of Plant Industry 2301 N. Cameron St., Hbg PA 17110 Phone: 717.346.0316, Cell: 717.585.3519 www.agriculture.state.pa.us

Additional Information:

Pennsylvania Department of Agriculture Fruit Tree Improvement Program Website: Click HERE

Attached:

2012 Fruit Tree Improvement Program Activity Summary. This is the most recent FTIP Activity Summary available at the time of compiling this report. This summary is published on the PDA FTIP website and given to the growers and other interested parties.

pennsylvania
DEPARTMENT OF AGRICULTURE

PA FRUIT TREE IMPROVEMENT PROGRAM
2012 ACTIVITY SUMMARY

The Pennsylvania Fruit Tree Improvement Program (PA FTIP) provides specialized virus inspection and testing services for participating Pennsylvania fruit tree nurseries. All material was tested for Prunus necrotic ringspot (PNRSV), prune dwarf virus (PDV), and tomato ringspot virus (ToRSV). All material also tested negative for plum pox virus (PPV), either through the PA Plum Pox Survey, or under the auspices of the FTIP program.

A total of 4,191 Prunus samples were processed through the FTIP laboratory this year, including 236 initial samples and 25 re-samples from a registered budwood production block, and 240 initial samples and 10 re-samples from a registered seed block. Composite samples from certified nursery production blocks numbered 1,090, and 109 composite samples were gathered from certified rootstock blocks. A total of 2,387 potential unregistered budwood source tree samples were submitted for testing by the nurseries, and an additional 94 common budwood samples and re-samples were collected by FTIP personnel. Two common budwood source blocks of cherry trees were tested for the first time for apple chlorotic leafspot and cherry leaf roll viruses, yielding negative results for both viruses. In addition, weed and soil samples were collected and tested, to monitor for ToRSV and its vector nematodes.

Results:

FTIP Certification Requirements Met: Registered blocks and nursery production blocks were found in thrifty growing condition, with no obvious signs of virus infection. All tested rootstock blocks were negative for all viruses of concern. All blocks met all virus-testing requirements for FTIP certification.

Plum Pox Virus: No PPV was detected in 2012, in nursery-related samples or in any other samples taken from the Commonwealth.

Tomato Ringspot Virus: No ToRSV was detected in nursery production blocks or in registered source blocks. Several common source trees were identified as ToRSV-positive. Presumably, these trees were avoided when selecting source wood for nursery propagation.

PNRSV and PDV: These two viruses remain the most commonly found viruses in Prunus in Pennsylvania, although finds in registered blocks and nursery production blocks are rare.

Dagger nematodes: Xiphinema sp. were present at very low but detectable levels in registered blocks, in nursery production blocks, and in proposed sites for nursery production. Their presence makes broadleaf weed (virus reservoir) control extremely important, to prevent introduction of tomato rinsgspot virus into the production scheme.

	2011			2012		
	No. samples	Viruses Found	Frequency	No. samples	Viruses Found	Frequency

			tested			tested		
		Registered Seed Block	236	PNRSV	<0.2%	240	PNRSV	<0.2%
		Registered Scion Block	241	PNRSV	0.7%	236	PNRSV	0.8%
		Common Budwood Sources	2,989	PNRSV, PDV, ToRSV	9.6%	2,481	PNRSV, PDV, ToRSV	9.0%
		Nursery Production Blocks	1,402	PNRSV, PDV	~0.5%	1,090	PNRSV, PDV	~0.6%

Project Title:	**Pennsylvania Wine Quality Initiative, Project 12**
Project Summary:	The purpose of the Pennsylvania Wine Quality Initiative was to improve the quality of Pennsylvania wines through wine quality training and sensory evaluation. The objectives of this several year program were to (1) enhance the quality of Pennsylvania wines through sensory evaluation training and testing in the PA Wine Quality Initiative program, and (2) provide educational support for the PA wine industry on wine quality parameters. The Pennsylvania Wine Quality Initiative (PAWQI) was established to train winemakers and industry professionals to identify wine defects, learn preventative practices to minimize the presence of wine defects in commercial Pennsylvania wines, and discover remediation techniques to encourage winemakers to alter defected wines prior to bottling and retail. Those winemakers or industry professionals that underwent initial training were encouraged to evaluate other Pennsylvania wines for potential wine defects in an annual, professional Sensory Evaluation session. Wines for this session could be submitted by any Pennsylvania commercial winery via the PAWQI program. The training and sensory evaluation testing provided through the PAWQI program was established to create more awareness and understanding of wine defects among Pennsylvania wine industry professionals. The PAWQI programs were designed to help new winemakers/wineries, as well as established wineries in identifying common wine defects through sensory training. Such training is often essential for quality control purposes in wine production because few analytical evaluations exist to identify common wine defects. Furthermore, the ability to identify defects and education on prevention and remediation has lead to the production of higher quality, defect-free wines in Pennsylvania.
Project Approach:	The continuation of the PAWQI program through the 2012-2013 fiscal year is built upon previously awarded USDA Specialty Crop grants, which aimed to enhance Pennsylvania winemakers' awareness and understanding of technical wine defects. Through 2012, the PAWQI program trained a total of 75 individuals through the two-day training workshop and half-day short course established at the PWA Annual Meetings. In 2013, there were an additional 27 individuals for the two-day "Level 1" training workshop in January 2013, and 15 participants at the half-day PWA Annual Meeting in March 2013. The goal of the original grant aimed to train 6 individuals at each two-day training workshop on an annual basis. The PAWQI program administrators requested feedback on the program and received an average score of 6.46 (on a 1 to 7 scale; 1 indicating lowest quality and 7 indicating highest quality) from participating individuals in January 2013. The "Level 2" Wine Sensory Attributes training workshop was held for a second year in February 2013. This second tier PAWQI program covers sensory training and manipulation of other sensory attributes found in wine

	(i.e. sour, bitter, astringency, sweetness, body/mouthfeel, alcohol content, and aroma/flavor). These components are considered additional quality standards beyond the minimization of wine defects. This 2013 workshop reached an attendance of 14 individuals. Overall quality of the course was a 6.18 of the 7-point scale. The annual Sensory Evaluation led by Extension Enologist, Denise Gardner and program manager, Mario Mazza, contained 31 submitted wines from award winners from the PWA annual wine competition and included 3 pre-bottled wines submitted by wineries. Wine defect screening and sensory evaluation was led by 6 previously trained (via the "Level 1" workshop) individuals. Sensory evaluation was conducted in individual booths at the Penn State Sensory Evaluation Center. Only wine defect presence (or absence) was evaluated for the 2013 Evaluation. Wineries that participated in submitting wines received a summary report on the panelists' findings, an average score for each wine defect, and panelists' comments. Finally, the digital "at home" wine defect training kits were completed and mailed to 210 Pennsylvania wineries, educators, and professionals. The kits were placed onto 8 GB flash drives that can be viewed on an HD-TV or home/winery computer/lap top. The video consisted of a short introduction on the PAWQI program and a 20-minute presentation (via Power Point with voice-over) on the basic wine defects. Each flash drive came with instructions for how to use/view the presentation, and wineries were encouraged to collect items that can be bought at grocery stores (e.g. canned vegetables, nail polish, onions, etc.) to help train employees on wine defect aromas/flavors as the presentation is viewed. Through the distribution of these flash drives, all 150+ Pennsylvania wineries were reached by the PAWQI program.
Goals and Outcomes Achieved:	The PAWQI has conducted multiple sessions during this grant period. These sessions included a two-day wine defect "Level 1" training workshop in which 27 individuals were present, a one-day "Level 2" wine sensory attribute workshop in which 14 individuals were present, and one full-day Sensory Evaluation session in which 31 wines were evaluated by 6 previously trained individuals in June 2012. Additionally, one half-day Short Course session was offered at the March 2013 Pennsylvania Winery Association Annual Conference, which held approximately 15 registrants. This session reviewed several of the wine faults that are considered most commonly present in Pennsylvania wines (e.g. oxidation, volatile acidity, high sulfur dioxide). The session served as an introduction to detection, prevention, and correction of these defects. Finally, the digital defects kits were distributed to 210 Pennsylvania wineries, educators, and industry professions in April/May 2013. The kits were used as an in-house training tool for the PAWQI program, but also as a marketing tool for Pennsylvania wineries to improve wine defect identification skills. The sensory programs registered a total of 56 individuals directly through the PAWQI educational programs ("Level 1," "Level 2," and the Short Course), and at least 210 through the direct mailing of the digital defects kits. The number of attendees that enrolled in the program were in addition to the registration numbers from previous training years. The PAWQI purchased supplies essential to the continuing sensory evaluation sessions that have been considered helpful by participating and surveyed wineries. This included the purchase of Wine Awakenings Defect Kits for those registrants in the "Level 1" programs and the state-wide distribution of the digital defects kits to all licensed commercial Pennsylvania wineries. Both kits can be taken back to the winery and used as training tools for individuals to routinely expose themselves to the technical wine defects. Research has shown that repeated exposure improves aroma/flavor recognition over time, in addition to lexicon development. It is hoped that by providing several techniques for wine defect identification to participating wineries, many winemakers or employees will be able to improve wines during actual production. Such 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 repeatedly in the wine industry literature.

In reviewing the overarching goals identified for the PAWQI, the expected measurable outcomes equaled 27 additionally trained panelists in wine defect identification and 15 Short Course trainees over a 3 month time period.

Additionally, 31 wines were submitted to the Sensory Evaluation session in the 2012-2013 grant term. These numbers are not in line with the targeted increase for participation (56 wines submitted in the 2011-2012 term) despite the intended benefit of objective feedback on specific wines to participating wineries. However, after surveying industry members, managers of the PAWQI program have found a greater interest in the educational programs (i.e. "Level 1," "Level 2"), which may help explain increasing registration numbers in 2013 for these workshops as opposed to Sensory Evaluation participation.

According to the records collected by the Pennsylvania Liquor Control Board, sales of Pennsylvania Wine in 2008 were 773,181 gallons. Sales by the gallon was not available in 2009; however the gallons sold increased steadily to 1,100, 025 in 2012 and 1,123,072 in 2011. Records are only available related to sales up until 2011. With the steady increase recorded increased sales are also anticipated for 2012 and 2013. The sales of PA wine have increased substantially with marginal increases in the number of wineries.

Pennsylvania Wineries have continued to enter state, national and international wine competitions. In 2012 and 2013 wineries entered more than 30 wine competitions and the PWA was notified of medal winnings at 25 of the competitions. Many of the international competitions had multiple wineries from Pennsylvania that received medals. Noted wine competition featuring winning Pennsylvania wines were the 2013 International Women's wine Competition, he 2013 San Francisco Chronicle Wine Competition, 2013 San Diego Wine Competition, 2013 International Eastern Wine Competition, 2013 Consumer Wine Awards, 2013 Grand Harvest Wine Competition.

Wine Award Winners

THE INTERNATIONAL WOMEN'S WINE COMPETITION IN CALIFORNIA AWARDED FRANKLIN HILL VINEYARD:
Franklin Hill Vineyards - http://www.franklinhillvineyards.com/
Pomegranate Peach
Double Gold and Best in Class
Fainting Goat
Silver
Evanswood
Silver

2013 SAN FRANCISCO CHRONICLE WINE COMPETITION:
Briar Valley Vineyard & Winery
2010 Lemberger
Silver

2013 SAN DIEGO INTERNATIONAL WINE COMPETITION:
Twin Brook Winery
Vidal Reserve
Gold

	For the complete list of PA Wine Award winners please go to http://www.pennsylvaniawine.com/awards
Beneficiaries:	Pennsylvania currently has over 170 wineries throughout the state, which has increased from the 130 original wineries at the beginning of the PAWQI program. All of PA's wineries benefit from the program. One of the greater benefits of the PAWQI program is providing technical, practical, and applicable training and education for those winemakers or winery employees that may not have had the background prior to opening their winery or becoming a winemaker. New wineries in the developmental stages now have the opportunity to participate in sensory evaluate classes and learn about wine defects and/or quality components. Participating wineries are able to take lessons learned via the PAWQI program and apply it to their production practices, hence improving their wines in-house prior to reaching consumers. Finally, winemakers share their experiences with fellow winemakers, which contribute to the progress of PAWQI and the overall wine quality of Pennsylvania wines. For those individuals that actively participated in one of the three training programs ("Level 1," "Level 2," and the Short Course) and the "at home" digital defects kits, the PAWQI program reached 266 people directly in 2013. Over the entire duration of the PAWQI program, a total of 449 individuals were reached directly. Documentation and progression of the PAWQI is updated on the "Penn State Extension Enology" website (extension.psu.edu/enology), listserv, Facebook page (https://www.facebook.com/PennStateExtensionEnology), and Twitter (@WineNews4You) account, which reaches over a total of 400 industry members in Pennsylvania, the Mid-Atlantic wine region, and national wine industry. This effort spurs industry involvement in the PAWQI, questions, communication, and highlights the program in a positive light to wineries. The PWA provides announcements for the PAWQI programming to the wineries in Pennsylvania via their bi-weekly email newsletter that is targeted directly to Pennsylvania wineries. Additionally, the PWA promoted the program to the membership at the PWA Annual Meeting and included a session in the educational programing that was presented. The PWA annual meeting reaches approximately 130 attendees and the educational session reaches approximately 30 attendees.
Lessons Learned:	The PAWQI program continued to gain recognition and momentum within the Pennsylvania wine industry. At the end of the 2012 season, industry feedback indicated a preference for educational programs on wine defects and sensory attributes. This objective was not initially feasible at the establishment of the PAWQI, but with the increased participation of the program and incorporation of the Penn State Extension Enologist executing the program, the PAWQI has reached a broader audience within Pennsylvania up through the 2013 program year. Funding dollars spent to distribute digital defects kits to all Pennsylvania wineries provided an opportunity to reach newer and existing wineries that may not have participated in the PAWQI otherwise. Preliminary feedback from wineries has been positive, and kits have been used in ways beyond the initial intent of the PAWQI program. These ways include cellar staff training programs to improve quality measures in the winery during several stages in production, recruiting tools to enroll future registrants in the PAWQI program and consumer education classes sponsored by individual wineries as a way to enhance awareness of wine quality efforts in Pennsylvania. The digital nature of the kits also gave winemakers an opportunity to learn wine defects on their own time and in-house, a request that had been suggested in several surveys conducted at PAWQI programs. Prolonging the maintenance of the PAWQI continues past the timeline of the current Specialty Crop Block grant. Those involved in the PAWQI believe this to be an important factor regarding the program. Based on the awarded funding and program success, development to continue the PAWQI as a self-sustaining educational program can remain for several more years and reach more industry members. Finally, due to the growth of the PAWQI, efforts have been made to accommodate a maximum of 36 registrants per year for the "Level 1" training workshops. The initial attendance numbers were beyond the scope of the

	grant, but the program was revised to allow greater numbers of industry members into the workshops annually. The revision allowed for breadth of the program to be presented to the session attendees and Pennsylvania wineries.
Contact Person:	Pennsylvania Winery Association 411 Walnut St., Harrisburg, PA 17101 Telephone: 717-234-1844 Email: pawine@verizon.net Contact: Jennifer Eckinger, Executive Director
Additional Information:	http://pennsylvaniawine.com/

Project Title:	**Mushroom Industry Food Safety Initiative, Project 14**
Project Summary:	The principal purpose of this project is to ensure a safe food supply and maintain the economic viability of the Pennsylvania mushroom farm community by providing education and training tools on food safety practices to growers, packers, shippers and processors. In January 2011, the Food Safety Modernization Act (FSMA), which mandates new regulatory requirements for produce, was signed into law. On January 16, 2013, the Food and Drug Administration (FDA) published proposed regulations outlining good agricultural practices for produce and preventative controls for packinghouses. This project provided an educational component of understanding the new, proposed regulations and adapting the mushroom food safety initiative to comply with new legal, regulatory and customer-driven demands and updated the necessary educational and training tools. Previous projects funded through Specialty Crop Block Grants (SCBG) 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 important and timely because the changes in the law will result in new requirements for growers, processors, packers and shippers. As always, the safety and wholesomeness of products throughout the mushroom production and distribution chain is of utmost importance to the continued viability of this industry.
Project Approach:	Since the proposed rules implementing FSMA were not published until January 2013, the activities and tasks performed in the earlier stages of the project focused on strengthening the educational and outreach components of the mushroom industry's food safety program. At the direction of the AMI Board of Directors, Food Safety Task Force, and Integrated Pest Management Committee, special emphasis was devoted to the proper use of pesticides. In June 2012 at the Penn State Mushroom Industry Conference, a summary of food safety research conducted by Penn State and funded in part by a previous SCBG was presented by Dr. Luke LaBorde. On June 21, 2012, a meeting for growers highlighting pesticide education was held in Kennett Square, PA with 51 attendees. The session was planned and delivered by Penn State faculty and Extension staff, members of the AMI Food Safety Task Force and AMI staff. A similar meeting for Spanish-speaking growers was held on July 17, 2012, with 17 attendees.

	As a result of feedback during these meetings, a question and answer document on proper pesticide use was developed in English and Spanish and distributed to the industry. A new column on proper pesticide usage, "Pest Management Matters," was published in the *Mushroom News*. In September 2012, the AMI Board of Directors and the Mushroom Council held a joint meeting to discuss the mushroom industry's food safety initiative. It was determined regular food safety education and training should continue, but any major revisions to the MGAP standard should wait until the FSMA regulations were published. Later that month, food safety updates were presented at two Penn State Extension mushroom industry meetings – in Temple, PA and in Kennett Square, PA with over 50 attendees. Proper pesticide use, in accordance with food safety guidelines, was again highlighted. In late October 2012, one provision of FSMA was implemented – the FDA Food Facility Registration requirement. AMI prepared a memo explaining the requirements for registration or re-registration. The memo was distributed by email to 117 recipients and was published in the *Mushroom News*. Following the *Federal Register* publication of the proposed produce and preventative controls rules in January 2013, AMI staff and AMI Food Safety Task Force members participated in numerous conference calls, listening sessions and meetings with FDA officials in order to gain a better understanding of the impact on the mushroom industry. An article was prepared for the *Mushroom News* regarding the release of the proposed rules. A memo outlining the relevant sections of the proposed rules for mushroom farms and packinghouses was prepared and distributed to the industry. Beginning in February 2013, a series of meetings were held by the Food Safety Task Force to review the rules, comparing provisions with the Mushroom Good Agriculture Practices (MGAP) standards and began the process of formulating comments. Activities carried out using SCBG funding outlined above with regard to the proposed produce and preventative controls rules were for educational and informational purposes only and were not expended on any lobbying or any activities associated with lobbying. Providing this educational experience of walking through line by line of what was proposed and comparing it to the existing requirements of the MGAP standard resulted in a greater understanding of how the proposal would affect the farms' daily practices. As often happens when new regulations come out, misinformation can cause unnecessary confusion. In general, growers were pleased that the procedures they carry out under MGAP matched those that would be required under FSMA. In the FSMA preventative controls regulations, emphasis is placed on sanitation and training. To meet these requirements, a new training program, "Packinghouse Sanitation Training Kit," was developed. The program is designed to deliver food safety training to the sanitation crew employees related to cleaning and sanitizing practices in the mushroom packinghouses. Proper sanitation is one of the most important activities for helping to minimize the risk of mushroom contamination at the packinghouses. A train-the-trainer workshop was held in Kennett Square, PA in June 2013 with 35 attendees. The Kit includes a booklet and DVD for use when training packinghouse sanitation employees. The DVD includes a video of Dr. Sergio Nieto-Montenegro of Food Safety Consulting and Training Services during the train-the-trainer workshop, as well as the PowerPoint presentation he used for this session. The DVD also contains an electronic version of the training booklet and PowerPoint slides to use when conducting the training with employees. The booklet provides the training PowerPoint slides on the left side and a script for the supervisor or trainer to use when conducting training sessions for employees on the right. The material is presented in English and Spanish. This and all food safety training materials can be downloaded from

	www.americanmushroom.org under the Food Safety tab. Penn State faculty and Extension personnel continue to be valuable partners in the project by assisting with grower meetings, translations and fact sheets. The Packinghouse Sanitation training workshop and Kit were a joint effort with partial SCBG funding provided by the Chester County Economic Development Council.
Goals and Outcomes Achieved:	Mushroom growers, processors, packers and shippers have access to all program elements, which leads to a stronger and expanded food safety program in their operations and a heightened sense of security by using proven food safety systems. A higher percentage of Pennsylvania farms have been certified (or re-certified annually) under the Mushroom Good Agricultural Practices program. As a result, the public should have a higher confidence level in the safety and wholesomeness of fresh mushrooms. The goal of this project was to improve and expand the food safety culture on farms, through increased educational and training materials that responded to identified needs, such as pesticide usage and the new food safety regulations. The educational seminars and training tools make it easier for those responsible for training, supervising, implementing and enforcing food safety messages and requirements. With respect to enhancing pesticide education, the new materials produced provided greater clarity for growers to understand pesticide regulations as evidenced by a reduction to zero in pesticide samples with violations in the USDA Pesticide Data Program. While not measurable in quantitative terms, the industry has approached the changes that will be required by FSMA with a clearer, more reasonable attitude based on their understanding of the proposals which will lead to more quickly adapting and complying with the law. While it was hoped that the FSMA proposed rules would be in the final stages by the time of the completion of the grant, the proposals provided a roadmap for the future that the education and training projects addressed. The sanitation training kit reached every mushroom packinghouse in Pennsylvania and represented the creation of an entirely new program for an entirely new audience. It addresses a major potential source of contamination in the mushroom supply chain. Another success was the video taping of the train-the-trainer workshop so those who could not attend could still benefit from the experience as well as receive the training materials (DVD and printed training kit). A positive outcome of the distribution of information regarding the FDA Food Facility Registration was that mushroom companies registered or re-registered free of charge. A number of for-profit entities had used this new requirement to make companies believe that there was a registration fee. Through its communications, AMI was able to provide factual information on this and the criteria for which establishments were required to register. During the time of this project, over 250 individuals attended educational seminars and training sessions. Since many of these were production and quality assurance supervisors, it is estimated that over 3,000 employees received various training messages. Through the support of the Mushroom Council, the same training materials were made available to growers and packers throughout the United States, thereby strengthening the entire industry's food safety culture. A testament to the success is the number of farms that have successfully passed a MGAP audit rising from 16 in 2010 to approximately 55 farms by 2013. In addition, a number of Pennsylvania packinghouses have completed audits benchmarked to the Global Food Safety Initiative (GFSI) standard.

	An additional goal was to take expanded food safety training messages and present them in new formats – this was accomplished through the Packinghouse Sanitation Kit by providing a videotape of the training and including a flip chart and all supporting materials on a DVD. The goal was to reach a wider audience and this was accomplished by videotaping the Sanitation Workshop and providing DVDs to all packers. To ensure widespread acceptance, all food safety materials are available in English and Spanish both in printed form and on the website.
Beneficiaries:	There are 66 mushroom farm operations in Pennsylvania, which last year led the nation in production with 571 million pounds of mushrooms representing a farm gate value of $540 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. There are approximately 26 mushroom packing operations in Pennsylvania that are affected by the FDA Food Facilities regulations and benefitted from the packinghouse sanitation training kit. Each of these farms and packinghouses are able to provide documentation to their customers of an established food safety program which is very frequently a requirement of a sales contract. On a larger scale, all workers receiving training have a broader understanding of food safety that they can utilize not only in the workplace, but in their daily lives as well.
Lessons Learned:	The obvious problem was the delay in the publication of the various regulations implementing sections of FSMA with which the mushroom industry must comply. By statute, these regulations were to be published one year after enactment (by January 2012); however, due to various reasons, the major regulations were not published in the *Federal Register* until a year later. Explanation and education of the new regulations gave a deeper understanding of what had already been accomplished and where additional measures needed to be taken. This gave the growers and shippers a higher comfort level with dealing with change. 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.
Contact Person:	Laura Phelps American Mushroom Institute , McLeod, Watkinson and Miller , 1 Massachusetts Avenue, NW , Suite 800 , Washington, DC 20001 Phone: 202-842-2345 Email: lphelps@mwmlaw.com

Project Title:	**Fay-Penn Economic Initiative "Fruit and Vegetable Farmer Markets & Sustainable Food Promotion Project", Project 17**
Project Summary:	In 2012 Fay-Penn maintained and developed 7 markets for the Fayette County Farmer's Markets and the Fayette County Buy Local Network. In 2013 we continued to develop the six (6) and one (1) new one for the Fayette County Farmers Markets. That made a total of seven (7) farmers markets for the Fayette and Greene County through the Fayette County Buy Local Network. The following seven (7) communities were identified for the farmer's markets for 2013: 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 7. Greensboro Started in 2013

In 2009 there were no farmers markets located in Fayette County. Access to fresh fruits and vegetables was very limited to local residents. Through this project we wanted to increase public awareness and access to more fresh fruits and vegetables in local food desserts through direct sales via farmers markets and other local venues. Improve and increase consumption of fresh fruits and vegetables. In 2013 we are averaging 150 people per farmers market.

The importance of this project is being able to help farmers move their product when available. Our farmers markets are July through September which is the peak growing season for specialty crops (fruits and vegetables.) This is the perfect time and that is went they have a lot to sell and may not have enough buyers for their products.

We did hire 2 part-time contract positions for the seven farmers markets for the 2013 season. The role was the managers would oversee the markets when open and work to identify other farm and vendors for the markets. Unfortunately one of the two part time staff will not be back for the 2014 season. That will have us looking for another person to help with the markets in the spring of 2014.

We are working with a number of group and agencies in the county to help identify other farmers and we are also helping new farmers get started raising specialty crops. We have worked with the backyard gardeners that are raising specialty crops and have gotten a number of them involved and they stated that they were even going to enlarge their gardens bigger for next year. We are also working with town of Greensboro, PA. Greensboro just started their farmer market in 2012 and we are seeing how we can work with each other farmers and have them at all the markets. This gave us seven markets. This is a way that we can join forces and make the markets stronger by them joining are marketing efforts. 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.

For the 2013 farmer markets season we expanded the season to the end of September. We finished the season the last week in September with Greensboro's finishing up the first week in October.
Fay-Penn also drove consumer traffic by using the Fayette County "Buy Local Program." This was done in the 2013 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 ($10.00 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 $700.00 per week for the entire season. For the 2014 season we are hoping to expand this program and we have asked for some funding from Farm Aid and PNC Foundation to match Fay-Penn funds that we have put in the program this year. That funding is pending at this time.

The number of people that benefited by this project was farmers. We had eight (8) different farmers attended each of our markets throughout the 2013 and we had three (3) others attend every once and awhile. We average around 150 consumers per market for the season 2013. For the 2013 season we worked with the farmer venders at the markets we estimated that a consumer spent on average of $10.00 at the market. We averaged about 150 people which we would have generated about $1,500.00 in sales for the farmers per market. We are estimating for the total 12 weeks for the 2013 farmer market season that we made an economic impact on the local economy of over $126,000 for our local farmers. These are farmers and venders that are raising or processing only specialty crops.

	Previous SCBGP funds have provided us the development of infrastructure and foundation of a marketing campaign and program that connects farmers to consumers on a timelier basis, which has increased the access to consumers as stated above.
Project Approach:	2012 we continue to develop the six (6) Fayette County Farmers Markets. In 2013 we maintained the six (6) farmer markets and started market the seventh (7). Over 90% of the farmer's market vendors were farmers selling only specialty crops. The other 10 percent were normally restaurant/food vendors, i.e. bakery, breads. Most bakeries used fresh fruits in their products. There was no dairy, meats, cheeses or ice cream. We provided matching funds in 2012 of $5,000 from the Fayette County Tourism Grant. In 2013 we provided matching funds of $40,080.50 through the USDA Farmers Market Promotion Program. The 2012 billboard development was paid for through SCBGP (copy is attached). The 2013 was not paid by SCBGP due to the fact we redesigning the billboard and made it more general. The 2013 billboard was paid for by the FMPP funds. We held a Buy Local Summit in September 2012 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. For the 2013 summit we had the PA Secretary of Agriculture speak to the group of 90 people. There were 30 farmers and 40 consumers there and other that was interested in hears how they can help with increasing the marketing, promotion and consumption of more Specialty Crops. The main focus was increasing public awareness on producing and consuming fresh fruit and vegetables and the impact that they have on the local economy. In 2012 and 2013, no SCBGP funds were used to pay for the Buy Local Summit. In 2012 funds came from Fay-Penn Economic Development Council. In 2013 funds came from Fay-Penn and SCBGP funds from ME#44123787 were used. We were able to hire two (2) part-time contract positions for the six farm markets for the 2012 and 2013 season. Fay-Penn also drove consumer traffic by using the Fayette County "Buy Local Program." We sent new Buy Local cards to approximately 19,000 households in December 2012. We also have distributed around 1,500 additional cards at various local events and sold another 1,500 and sold 300 cards just at the Farmers Market. This was done in the 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 ($10.00 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 also offered the same program and we also had our Buy Local Cards available for sale ($10.00 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 $700.00 per week for the entire season. For the 2014 season we are hoping to expand this program and we have asked for some funding from Farm Aid and PNC Foundation 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 market season, we had to cancel only four markets due to inclement weather. In 2013 we averaged 150 consumers per market. We were able to get a much better count of attendant with having a manager at each of the markets. We feel that the farmers markets were a huge success last two years and consumers are already looking forward to next year's markets.

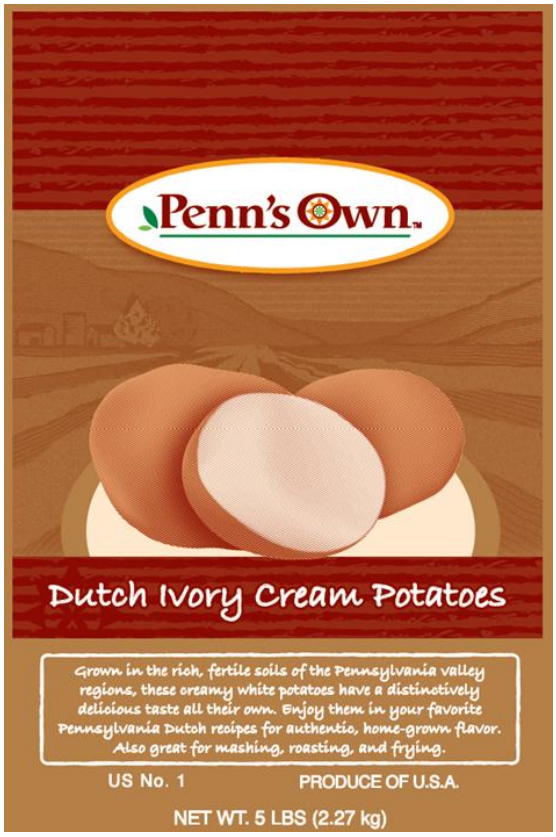
Goals and Outcomes Achieved:	**<u>Objective 1:</u> Sustain the current six (6) farmers markets and create at least one (1) new farmers market**. We plan to continue supporting the current (6) farmers markets in redundant that will begin in April 2012. Develop one new farmers market in 2012; and continue to provide managerial support to all seven farmers markets throughout 2012. **1.** We are continuing to supporting the current six (6) farmers markets **2.** We did develop one new farmers market in 2012 Greensboro which is in Greene County and add it to the marketing plans. **3.** We are continuing to provide management support to all seven farmers markets for 2012 and 2013 seasons. **<u>Objective 2:</u> Create a plan to develop and implement Fayette County's Regional Agriculture Infrastructure:** Hold two sustainable farming and community workshops. This educational training will gather farmers, businessmen and consumers as a means to support the aims and benefits of a sustainable farming and farmer's markets network; **1.** We held two sustainable farming and community workshops one in 2012 we had six break-outs on specialty crops on growing and cooking fruits and vegetables. There were 3 workshops on growing averaging 30 participants, and 3 cooking workshops averaging 40 in the cooking workshop. In 2013 the entire day was on specialty crops and the value on the community and the economy. For the 2013 summit we had the PA Secretary of Agriculture spoke to the group for 80 people. **<u>Objective 3:</u> Continue to develop and implement a marketing plan for the farmers markets that have locally grown fruits & vegetables and other specialty crops through a county wide marketing campaign:** 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 seven local farmers markets to consumers, local restaurants and grocery stories. **1.** We developed and distributed 24 issues of the monthly newsletter (Be Local BUZZ) on issues dealing with food supplies, safety, production and other related issues. The Be Local Buzz is distributed as a supplement in the Herald-Standard newspaper. It is delivered on the fourth Sunday of each month to approximately 21,000 households in the Fayette County area and 5,000 households in the Greene County area. In 2012, we unveiled and released the "new" Buy Local Card. By Fall 2013, we had more than 22,000 cards, which is a 10% increase since the cards were released. In 2012 100 cards were sold, and in 2013 30 cards were sold, which is a 2% increase. **2.** We facilitate and Managed over the past two years a major marketing campaign for the seven local farmers markets that included TV ads, radio ads, news print ads and soft paperback book ads **<u>Objective 4:</u> Increase the number of consumers eating healthier, locally-produced fruits and vegetables:** Develop a 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 outlining the benefits of buying local farm products at our seven local farmers markets. **1.** We develop an educational brochure curriculum regarding sustainable community efforts on health eating of fresh fruits and vegetables, specifically in relation to local agriculture and including low-income consumers. **2.** We developed and distributed 24 receipts on cooking with fresh fruits and vegetables and other educational materials to consumers regarding the health benefits of buying local farm products.

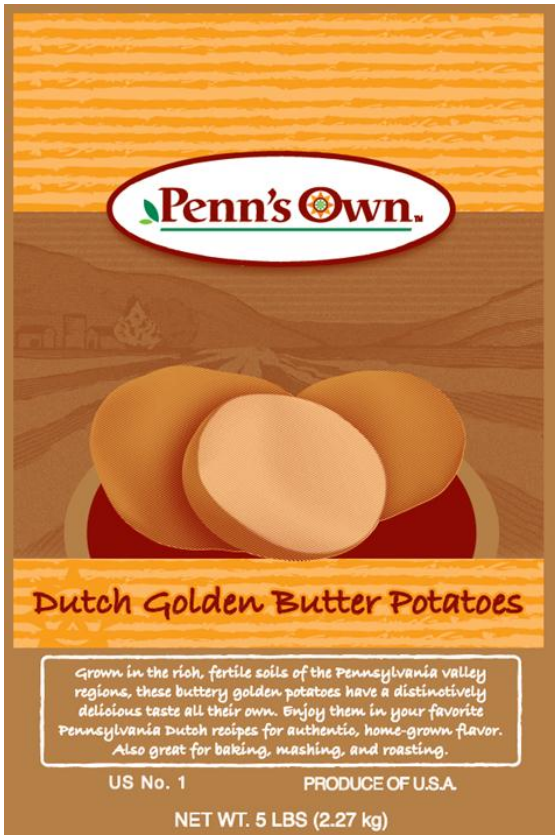
	3. We know there were more people eating fresh fruits and vegetables as indicated by sales increase at the markets over last year. We are planning on implementing a survey/poll to get even better results in 2014.
Beneficiaries:	The people that benefited by this project was farmers and consumers both in 2012 and 2013 farmer's market seasons. We had six (6) different farmers attending our markets throughout the 2012 farmer's market season and eight (8) for the 2013 farmer's market season. We average around 90 consumers for the season 2012 and 150 for the 2013 season. For the 2012 season we worked with the farmer venders at the markets we estimated that a consumer spent on average of $10.00 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. For the 2013 season we had eight (8) different farmers attended each of our markets throughout the 2013 and we had three (3) others attend every once and awhile. We average around 150 consumers per market for the season 2013. For the 2013 season we worked with the farmer venders at the markets we estimated that a consumer spent on average of $10.00 at the market. We averaged about 150 people which we would have generated about $1,500.00 in sales for the farmers per market. We are estimating for the total 12 weeks for the 2013 farmer market season that we made an economic impact on the local economy of over $126,000 for our local farmers. Our estimates are based on the number of patrons to the farmers markets. These are farmers and venders that are raising or processing only specialty crops.
Lessons Learned:	One major lesson was not to move the market from place to place like we have in Ohiopyle the last three year we have had four different locations in Ohiopyle and that hurt the Farmers Market and this year it was the worse market as for farmers, visitors and venders. All the other markets were very strong due to the fact we have not moved them from the time that we started in the pasted years. Another lesson which is a good one 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, 2012, 2013 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. This program has help with driving consumers to the markets and we are trying hard to find additional funders to be able to expand this program for the 2014 farmer's markets season. 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 newspapers, The Herald Standard and the Greene County Messenger, once a month that goes out to 25,000 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 weekly. 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:	Name the Contact Person for the Project: Robert C. Junk, Jr. Telephone Number: 724-437-7913 Email Address: bobj@faypenn.org
Additional Information:	http://faypenn.org/

Project Title:	**Pennsylvania Brand Potato Trademark and Marketing, Project 18**
Project Summary:	**Project Purpose**: Establish a Pennsylvania-specific brand for round white and yellow potato varieties grown in Pennsylvania and sold exclusively by members of Pennsylvania Co-Operative Potato Growers, Inc. (PCPG) to retail grocery customers in Pennsylvania and surrounding region ✓ "Qualify" specific varieties that can wear the Penn's Own brand ▪ Must deliver a consistent cooking and eating experience ▪ Round white and yellow potatoes grow best in PA ✓ Provide PA retail customers with an easily identifiable, high quality "local" potato brand ▪ Support their "locally grown" promotions and programs ▪ Meet increasing shopper demand for locally grown product. ✓ Make it easy for PA consumers to identify PA-grown product and the retailers that carry it ✓ Provide PA growers with a consistent "umbrella" brand under which they can market their potatoes ▪ Not a "seal" or stamp that can go on any PA product…unique to potatoes and specific varieties ▪ Recognizable and preferred (potential) ▪ Eliminate retail clutter and confusion ▪ Reduce packaging inventory ✓ Help educate consumers on the unique taste, texture, cooking properties, and suggested uses for round white potatoes and yellow potatoes vs. each other and vs. other potato types ▪ Red shale soil in PA creates a unique taste and texture profile: distinct taste, nutty, earthy, distinctive savory flavor, unique appetizing taste **Importance/Timeliness**: "Locally grown" is a continuing macro-cultural trend ✓ Consumers are seeking "locally grown" produce … from local sources ▪ Desire for "real", "authentic" foods and a connection with the farmer ▪ Importance of in-store experience ▪ Community health…support the community ▪ "In-season"

	✓ Exploring farmer's markets ▪ But also tend to shop local stores/chains more than "national" chains ✓ Increasingly prefer fresh ▪ Supports their goal of personal wellness ✓ Local = quality, freshness, value (especially when in-season) <u>For Millenials: food is a social experience, opportunity for exploration</u> ✓ Looking for fun and exciting … but natural and unprocessed ▪ Variety, variety, variety ▪ Seasonal in/outs … "limited time only" ▪ Recipes... In store, on-line, on-pack ▪ Pair with on-trend ingredients, seasonings, etc. <u>Growth in the specialty potato segment is outpacing the total category</u> ✓ Consumer desire to "get out of their potato rut" by looking for new/different ways to prepare potatoes ✓ Growing awareness of specialty varieties and their unique cooking/flavor properties via cooking shows and on-line recipe resources ✓ Influence of multi-cultural cuisines <u>Challenges to Success</u> ✓ Ability to "Break in" to Retailer's "Own Brand" strategy ▪ Emphasize seasonal, in-and-out opportunity ▪ "Seek locally grown" = "shop local retailers" ▪ Independents as well as larger chains ✓ Limited Merchandising space ▪ Propose Pallet and/or Bin programs ▪ Lobby in-and-out ▪ Tie into retailer's locally grown theme promotions…requirements significant planning lead time
Project Approach:	**<u>Selection of Overarching Brand Name</u>**: Research into Pennsylvania heritage, culture, imagery, geology, and agriculture served as platforms for brand name ideation. An extensive list of names was generated by The

Chesapeake Group, the selected design firm, and reviewed with the Project Team for a strategic fit and overall appeal to the target audience. A subset of names was selected for preliminary review for trademark availability, which suggested that the most preferred name, "Penn's Own", might be available for use. A comprehensive trademark search was then conducted by a trademark attorney with Frost Brown Todd for confirmation and an intent-to-use application for both fresh vegetables/potatoes and processed vegetables/potatoes was filed with the USPTO for the name "Penn's Own". Fresh and processed vegetables are two separate trade classes and this will provide the most





flexibility as we introduce and expand the concept in the future. USPTO issued a Notice of Allowance for both classes on September 17, 2013 and certificates of registration on February 11, 2014.

Creation of the Brand Logo and Variety "Fanciful Names": The Chesapeake Group created and presented a range of logo design alternatives and variety "fanciful names", from which we selected the final design and chose "fanciful names" to serve as product descriptors for the round white and yellow potatoes grown within Pennsylvania (see Figure 1): "Penn's Own® Dutch Ivory Cream Potatoes" and "Penn's Own® Dutch Golden Butter Potatoes".

Figure 1: Penn's Own Logo Designs

Package Design: This logo was then used as the basis for the brand and was applied to a package architecture and design for retail sale by Northeast Packaging, the bag manufacturer (see Figure 2 and Figure 3). With the package architecture in place, we produced both paper and poly bags (see Figure 4).

Figure 2: Penn's Own Dutch Ivory Cream Potatoes **Figure 3: Penn's Own Dutch Golden Butter Potatoes**

Figure 3: Penn's Own Dutch Golden Butter Potatoes

Figure 4: Penn's Own Actual Kraft and Poly Bags

<u>Sales Materials</u>: With the brand and package ready for harvest, packing and customer sell-in, a sell-sheet was created in-house for the PCPG and SMI sales teams to use with their customers (Figure 5 and Figure 6). In addition, the program was re-presented to the Board of the PCPG. Production of high-graphic bins were explored as a promotional merchandising vehicle; however, minimum purchase quantity and production cost were prohibitive for the 2013-14 season. Penn's Own® is also featured in the new Sterman Masser, Inc. website (stermanmasser.com).

Figure 5: Penn's Own Sell Sheet (Front)

NEW!

Penn's Own™ Potatoes

Enhance your Locally Grown program with Penn's Own Dutch Ivory Cream and Dutch Golden Butter Potatoes

- Your shoppers will enjoy a delicious, consistent cooking and eating experience unique to Pennsylvania-grown white and yellow potatoes
  - Only qualified varieties grown in Pennsylvania can carry the Penn's Own brand name
  - Only available from members of Pennsylvania Co-Operative Potato Growers, Inc.
- Merchandising Recommendations
  - Include with other produce items in support of seasonal "locally grown" theme displays and feature ads
    - Promotional display bins available from PA Co-Op shippers
    - Produce table end caps
  - Display on the primary potato table next to other specialty potatoes during the peak fresh harvest season

	Penn's Own Potatoes			
	5 lb. Paper Bags		5 lb. Light Blocker Poly Bags	
	Dutch Ivory Cream	Dutch Golden Butter	Dutch Ivory Cream	Dutch Golden Butter
UPC	0-78791-00000-4	0-78791-00002-8	0-78791-00001-1	0-78791-00003-5
Product Spec	US No. 1			
Potato Size	2" minimum			
Item Weight	NET WT. 5 LBS. (2.27 kg)			
Case Weight/Pack	50 lbs. - 10/5 lb. Bale Bags			
Case Dimensions	30" x 14" x 7"			
Case Cube	1.7			
Pallet Count	40 Bales			
Pallet Pattern (tie x high	5 x 8			

Penn's Own™

Available exclusively from the members of Pennsylvania Co-operative Potato Growers, Inc.
© 2013

Figure 6: Penn's Own Sell Sheet (Back)

Customer Sell-in:

- ✓ 2013/14 Crop Year
  - Bags were produced and sell sheets were distributed in early August, 2013, just prior to harvest
  - Penn's Own® Potatoes were featured in sales presentations to the following customers:
    - Giant Carlisle and Landover (Divisions of Ahold USA): June, November, December

      - Seasonal distribution April-July 2014 featuring Penn's Own Dutch Golden Butter
    - Redner's, Weis, Delhaize (Food Lion Greencastle DC), and McAneny Brothers (Wholesaler) were all presented the product line in August; however, none of these customers authorized the item for distribution or promotion from the 2013/14 Crop.
  - Penn's Own® Potatoes were also featured in the January, 2014 Pennsylvania Farm Show on "Potato Day", where guest Chefs featured them in recipes prepared and sampled by attendees.

2014/15 Crop Year

- Penn's Own Potatoes were presented to the following Pennsylvania-based customers
  - Giant Carlisle/Landover, Redner's, AWI, Weis, Delhaize, and McAneny Brothers.
  - To date, only Redner's has authorized distribution (both Dutch Ivory Cream and Dutch Golden Butter); shipments began August 14, 2014.

	▪ Penn's Own Dutch Ivory Cream Potatoes were a featured item in the grand opening of a new Camp Hill, PA Walmart in August, 2014 o Total sales: 200 bag bin; $386 **<u>Significant contributions and role of project partners</u>**: ✓ Sterman Masser, Inc. ▪ Grant and annual report preparation and submission ▪ In-kind funding of sub-contractor, retailer sales data ▪ Project oversight ▪ Approval of brand name, logo, fanciful names, and package design ▪ Exploration of high graphic bins ▪ Customer sell-in ✓ Pennsylvania Cooperative Potato Growers, Inc. ▪ Financial stewardship of USDA funds ▪ Project oversight ▪ Approval of brand name, logo, fanciful names, and package design ▪ Customer sell-in ✓ Sherrie Terry, sub-contractor ▪ Strategy, direction, and management of legal, design, packaging, and data resources and processes (Frost Brown Todd, The Chesapeake Group, Northeast Packaging, Nielsen Perishables Group) ▪ Budget and invoice management ▪ Input into grant and annual report preparation ▪ Data collection, analysis, summarization ▪ Sales material preparation; sales training; customer sell-in assistance as requested
Goals and Outcomes	**<u>Completed Activities</u>**: Penn's Own® Potatoes are now available to all members of the PCPG. Currently, there

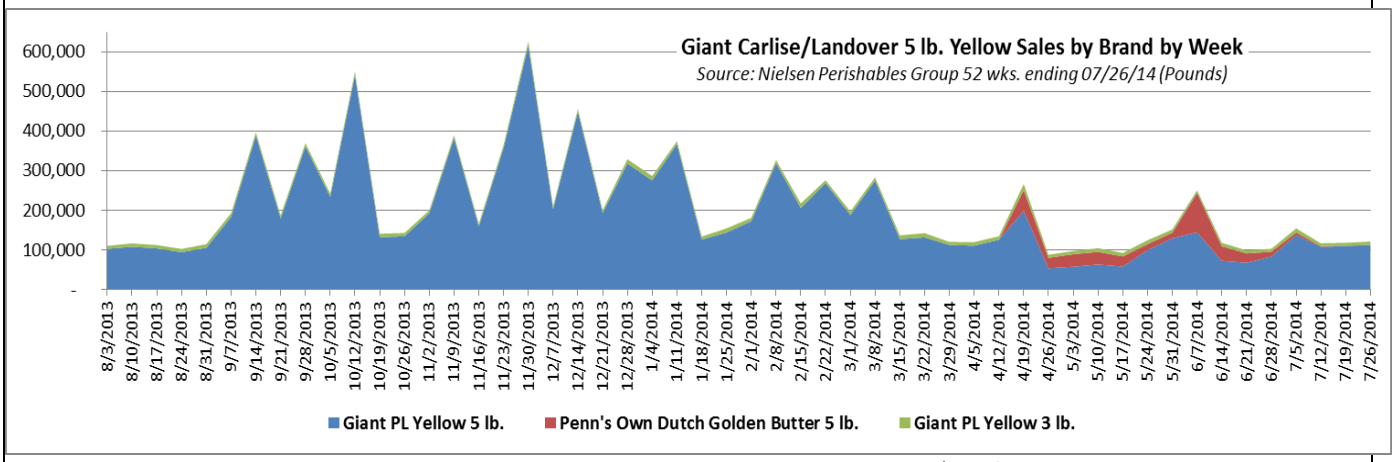
Achieved: are between 35 and 40 growers that are members of the PCPG, who have access to this proprietary, trademarked brand that will allow them to market their crop to grocers under a consistent, recognizable label. They will have the ability to purchase bags and containers for the brand, while benefiting from the established marketing that is being provided by the PCPG.

- ✓ Brand name selected and trademarked
- ✓ Varietal names selected
- ✓ Logo completed
- ✓ Packaging design completed
- ✓ Bags have been produced
- ✓ Sell-in materials completed and available
- ✓ 2013 sell-in complete; 2014 sell-in in process

Measurable Outcomes:

Giant Carlisle & Landover: Penn's Own Dutch Golden Butter April-July 2014

- ✓ Penn's Own retail scan sales for the period totaled $339M and 378M lbs.
  - Penn's Own = 9% of total 5 lb. Yellow dollar sales and 8.5% of total 5 lb. Yellow pound sales
  - Total 5 lb. Yellow sales (Private Label + Penn's Own) declined -14% in dollars and -7% in pounds
    - 2014 ARP was $.84/lb vs. $.90/lb YAGO



    - Private Label and Penn's Own were parity priced at ~$.99/lb
    - 3 lb. pouch Private Label sales grew +6% in both dollars and pounds during the same period, at a higher ARP ($1.33)

- ✓ Preliminary observations
  - Penn's Own helped to mitigate a declining trend in 5 lb. bag sales during the period
  - Easter and Father's Day promotion timing drove sales lifts; traditional post-Easter sales drop-off impacted total volume.
  - Seasonal distribution and promotion during fall harvest/fresh crop/holiday season may generate greater incremental sales

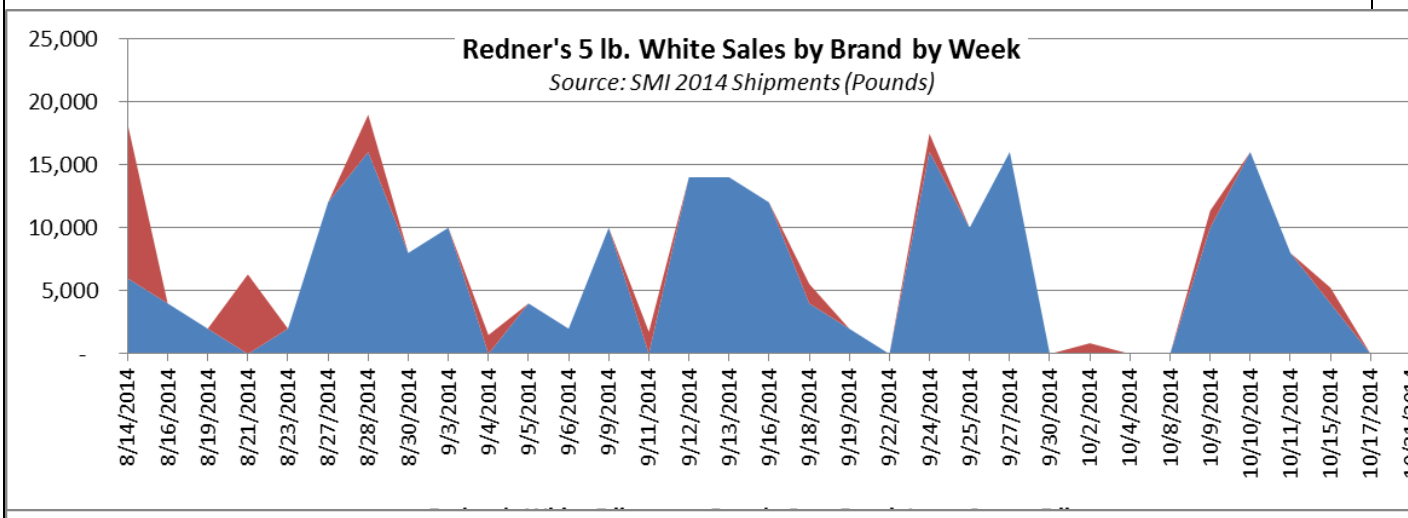
Redner's Fall 2014 Promotion

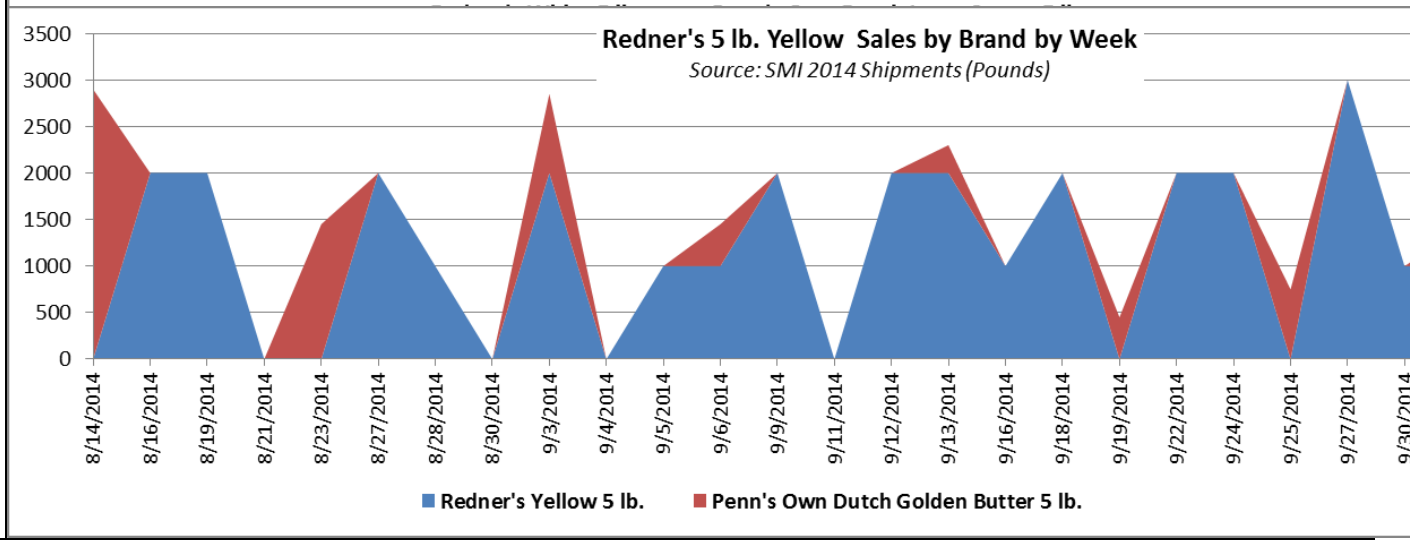
- ✓ SMI Penn's Own Potato shipments to Redner's YTD (August 14-October 23, 2014) total $12M and 40M lbs.

  Note: Nielsen Perishables Group Retail Scan data is not available for Redner's
  - Sales by variety skew heavily to Dutch Ivory Cream
    - Dutch Ivory Cream $9M 32M lbs.
    - Dutch Golden Butter $3M 8M lbs.
  - This represents 14% and 13% of Redner's 5 lb. yellow and white revenue and volume, respectively
    - Dutch Ivory Cream 13% $$ 14% lbs.
    - Dutch Golden Butter 21% $$ 22% lbs.
  - For the period, total 5 lb. white volume at Redner's is up +180%; total 5 lb. yellow volume is down -30%
- ✓ Preliminary observations
  - It appears that Redner's has alternated between their Private Label brand and Penn's Own during the promotion period (versus dual distribution)
  - It is too early to assess the performance of this promotion, as it is currently underway. Total volume and revenue sales, impact on overall 5 lb. white and yellow volume, and customer feedback will be captured and summarized following the promotion period.

Overall Assessment

- ✓ Segment growth vs. original target of 10%
  - Customer authorization has been less than expected
    - Promotional support for own Private Label brands
    - Category assortment rationalization
    - Lack of merchandising support for seasonal display (i.e. high-graphic bins, pallet wrappers, etc.)
    - Need to begin sell-in earlier to increase chances for inclusion in "locally grown" promotions





	○ The petite-sized, convenience, and smaller bag size segments of the category are growing at a faster rate and at the expense of the more "mainstream" 5 lb. bag segment ✓ Sales efforts are currently limited to SMI; expand program and sales training across the PCPG grower network to insure maximum "feet on the street" to leverage the opportunity ✓ Building brand awareness and equity is a long-term proposition; although outside the scope of the original budget, development of cost-effective, high impact merchandising and consumer programs to support trial should be considered. ✓ The PCPG needs to strategically and proactively identify and document the specific potato varieties and the quality specifications which will be "allowed to wear" the Penn's Own® brand, to insure consistent quality and eating experience in every bag, while insure sufficient volume is available to promote and grow sales.
Beneficiaries:	✓ PA retail customers now have an easily identifiable, high quality "local" potato brand that they can promote seasonally ▪ Support their "locally grown" promotions and programs ▪ Meet increasing shopper demand for locally grown product. ✓ PA consumers can readily identify PA-grown product and the retailers that carry it ✓ The 35-40 PA grower-members of the PCPG now have a proprietary, consistent "umbrella" brand under which they can market their potatoes ▪ Not a "seal" or stamp that can go on any PA product…unique to potatoes and specific varieties ▪ Recognizable and preferred (potential) ▪ Eliminate retail clutter and confusion ▪ Reduce packaging inventory ✓ Assuming a turn rate and number of weeks/year in distribution comparable to what has been experienced to date at Giant Carlisle/Landover, the Penn's Own brand could have an economic impact of 1,000 lbs. / $990 in retail sales per retail point of distribution.
Lessons Learned:	✓ It is becoming increasingly difficult to secure incremental/seasonal brand distribution with the major retail chains ○ "Clean store" policies ○ Focus on own brand Private Label

	○ Assortment rationalization ✓ Merchandising and promotional support for the item launch needs to be included in the marketing budget ✓ Sell-in should begin during Q1 to insure inclusion in retailer fall locally grown promotions
Contact Person:	Pennsylvania Brand Potato Trademark and Marketing Presented by; Sterman Masser, Inc. 2 Fearnot Road P.O. Box 210 Sacramento, PA 17968 570-682-3709 Contact: Keith Masser Contact: Julie Masser Ballay Pennsylvania Co-Operative Potato Growers, Inc. 3107 North Front Street Suite 100 Harrisburg, PA 17110-1328 717-232-5300 Contact: Roger Springer Contact: Nolan Masser
Project Title:	**"Eat Fresh Here", Project 19**
Project Summary:	Eat Fresh Here, the farm to cafeteria tray program in Philadelphia public schools completed its second full year in June 2012. Over the course of the year, PA specialty crops were served in 32 public schools across the City of Philadelphia, and this year, Eat Fresh Here created meaningful ways to both raise awareness of the program and its PA specialty crops to youth, while also gathering information about how youth best communicate about healthy eating of specialty crops among their peers. Eat Fresh Here is a collaboration of the School District of Philadelphia (SDP)'s Division of Food Services, Fair Food, the Philadelphia Urban Food & Fitness Alliance (PUFFA) and The Food Trust. Program Objectives: 1. To continue to provide technical assistance around Farm to School and PA specialty crop to the fifty District sites implementing Eat Fresh Here 2. To build a more visible and wide-reaching marketing campaign within schools, promoting the project. 3. To better connect existing in-school program (e.g. nutrition education, culinary programs) with the Eat Fresh Here programs in the cafeteria, reinforcing messaging around consumption of specialty crops. 4. To more broadly reach communities at-large about the health benefits and availability of specialty crops in their neighborhoods. In Philadelphia, the rates of overweight and obesity for non-poor Philadelphia children is about 40 percent. But for Philadelphia's poorest kids, it's almost 52 percent. The First Congressional District of Pennsylvania has been ranked as the 4th most food insecure in the nation. This district sweeps through much of the City of Philadelphia and into Delaware County. Current estimates state that 1 in 4 persons in Philadelphia are food insecure and in

	Philadelphia's poorest neighborhoods, the rate of food insecurity rises to 1 in 3 residents, double the nation's average. Public schools play a critical role in providing nutritious, balanced meals to over 150,000 students per day, and incorporation and promotion of healthy specialty crops into school meals help meet the nutritional needs of school-aged children. Approximately 75% of students in the SDP are eligible for free and reduced-price meals, and for many of these students, school meals are their most reliable, consistent source of nutritious foods and access to fresh, healthy fruits and vegetables. Of equal importance to the health and economic welfare of the Commonwealth is increasing viable markets for Pennsylvania specialty crop growers. American Farmland Trust reports that as much as half of all farmlands in the nation will change hands in the next 10-15 years. Sustained, fair business is a key component to maintaining farm viability, and creating lasting vendor-buyer relationships. Bringing together the purchasing power of the 5th largest school district in the nation with PA specialty crop growers will continue to add value to a strengthening regional supply chain, better benefiting both the consumer and farmer ends of that chain. Farm to School programs provide a timely and significant intersection in meeting the needs of both children in need of good nutrition and a stronger understanding of healthful, PA-grown specialty crops, and expanding marketing opportunities for our region's fruit and vegetable growers. The purpose of this project is to promote, serve, and provide education around PA specialty crops to more Philadelphia school children, and to continue to provide a steady, viable market to PA fruit and vegetable growers. This year's expanded program to 50 School District of Philadelphia cafeterias further promoted specialty crops. And while the previous year's program was more focused upon implementation on the production end of the equation, the program for the 2011-2012 school year utilized a more community-based approach to promoting specialty crops not just in the cafeteria and within the confines of the school day. We implemented a more integrated approach to promotion and education around PA specialty crops by utilizing existing nutrition educators within the schools with our partners at The Food Trust and the SDP. We also worked closely with on-the-ground partners through the Philadelphia Urban Food and Fitness Alliance (PUFFA), a current Fair Food partner to this work. Specifically, we partnered not just with the PUFFA project director, but with PUFFA's two community-based agencies: The Enterprise Center Community Development Corporation (TEC CDC), and the Southeast Philadelphia Collaborative (SEPC). TEC CDC's mission is to "build equitable communities that enhance Philadelphia's urban fabric through the endeavors of their residents." Similarly, SEPC "informs, educates and organizes a broad and diverse network of community partners, policymakers and stakeholders to leverage greater access to resources and opportunities that address the needs of youth in Southeast Philadelphia." Working closely with both parents and youth, The Enterprise Center and the Southeastern Philadelphia Collaborative were integral to promoting the use of specialty crops both within the schools, and in their respective communities. These strong partnerships utilized our existing networks to better inform, educate, and promote the market availability and nutritional benefits of specialty crops inside and outside the classroom.
Project Approach:	Program Objective Updates: October 2011-September 2012 Introduction: Eat Fresh Here kicked off its specialty crop procurement in October 2011 in 30 District Schools. While the DFS and the project team had anticipated the inclusion of 50 schools in Eat Fresh Here due to budget constraints and resulting changes in resources, DFS decided to launch the program at a more conservative 30 cafeterias for the 2011-2012 school year; in January, 2 additional schools were added to bring the total to 32 schools.

Technical Assistance:
In October, all 30 sites participated in an in-depth Eat Fresh Here training, facilitated by the project team, and members of Les Dames d' Escoffier. Cafeteria cooks and managers attended a half-day training at Philadelphia High School for Girls to learn more about PA specialty crops and seasonality, how Eat Fresh Here operates, menuing specialty crops, and the nutritional value of these fresh produce items. Cafeteria managers received separate trainings on ordering, receiving, and handling of produce, and promotion of the project using the visual aids they had been given. Cafeteria cooks received hands-on knife and prep training from professional chefs. In total, 75 School District staff attended, as well as five project team members.

Eat Fresh Here e-newsletters have been circulated to all 30 schools, as well as farm to school stakeholders, informing those interested in the progress of the program, as well as policy updates from USDA, and local news about farm to school and PA specialty crops.

In February 2012, the project team assisted the DFS in building their local produce bid for the 2012-2013 school years to include PA specialty crops. The creation of detailed local produce bid is considered by the team to be a major milestone in making Eat Fresh Here a part of school food operations for the long term. The bid for the 2012-2013 school was awarded to Kegel's Produce in June 2012 and the preparations for the upcoming year began at that time.

Objectives Updates for Marketing, Promotion, and Community Outreach:
While Fair Food and our project partners began our regular communications and planning with program schools commenced, parallel community-based outreach began as well. As part of a great effort to inform the greater school community about Eat Fresh Here, flyers were developed for in-school use, for community meetings, back to school nights, and for youth gatherings. These flyers were distributed by school district personnel, the project team, and project partners The
Enterprise Center CDC (TEC-CDC) in West Philadelphia, and the Southeast Philadelphia
Collaborative in Southeast Philadelphia.

In December, TEC-CDC, Fair Food, and DFS hosted a "School Food 101" learning session for residents of the Walnut Hill neighborhood in West Philadelphia. This session was an opportunity to educate the community at large about the National School Lunch Program, and Eat Fresh Here. One hundred five audience members were counted, and 10 partners and project team members were present.

Meanwhile, all 30 schools in the program received Eat Fresh Here posters and point-of-sale cards for on-the-line promotion of the specialty crops being served that day. Additionally, youth PSAs advertising healthy eating, Eat Fresh Here and choosing specialty crops began to be televised in schools across the District on LCD monitors located in school cafeterias.

October, November, December and early January resulted in the sale of approximately $46,000 of PA specialty crops to the 30 schools in the Eat Fresh Here program; about 44,000 pounds of produce. During these months, the project team distributed newsletter, engaged youth in focus groups about peer-to-peer marketing and program awareness.

Taste-testing's of specialty crops took place in 3 Eat Fresh Here sites as a way to build additional program awareness. These apple tastings were conducted in-cafeteria to maximize the number of student tasters, as well as to build a connection between the apples being tasted and those being served on the cafeteria line.

	Three youth focus groups were conducted in March and April, resulting in feedback designed to help inform how youth market concepts like healthy eating to one another. As a result of the focus groups, promotional "locker postcards" were distributed to the test schools for distribution in the lunchroom and in lockers. Three postcards were designed, each featuring a specialty crop item being offered for lunch, and included bullet points about healthy eating, local food, and spreading positive messages to their peers. In January 2012, a "School Food 201" session was coordinated by Fair Food, and hosted by the DFS for community agencies, partners, and those interested in working with the District on good school food. The session was attended by 50 professionals and both resulted in positive information exchange, idea-sharing, and better connected those agencies and organizations working towards a healthier school meal in the city. <u>Connecting with Existing Infrastructure & Programs:</u> The "Eat.Right.Now." nutrition education program administered by the School District of Philadelphia has helped engage students and their families through distribution of flyers and information about Eat Fresh Here. School nutrition educators have also helped facilitate taste-testing's of PA specialty crops as part of Eat Fresh Here marketing efforts. Youth wellness councils were established in about 50 District schools during the 2010-2011 school year. Several councils at Eat Fresh Here sites have been engaged in taste-testing and surveying efforts of students, including at Northeast High School, High School of the Future, and Washington Carver High School. Over the next several months, the project team anticipates continuing to involve these councils as a way to better connect overall wellness to Eat Fresh Here program awareness and the promotion of healthy specialty crops in the cafeteria. PUFFA Youth have been engaged to promote Eat Fresh Here in their monthly youth gatherings, and as part of their healthy eating messaging. Youth that participated in the focus groups received promotional postcards for Eat Fresh Here to distribute in school. Fair Food and the School District of Philadelphia anticipated the purchase of about $250,000 towards specialty crops over the 2011-2012 school year, across 50 school cafeterias within the City of Philadelphia. Locally-grown fruits and vegetables were purchased via Common Market, a non-profit, values-based aggregator and distributor of solely local produce. Common Market currently purchases fresh fruit and vegetables from approximately 20 Pennsylvania fruit and vegetable growers and we expect that this project will impact specialty crop grower through increased sales of these items to the schools. Dedicated to returning as much as 70 cents of every dollar to their farmers, Common Market's farmers can benefit from the anticipated sales for the next school year. The SDP has an enrollment of 154,482 students and serves over 200,000 meals per day. By expanding this farm to school program to reach fifty cafeterias, we anticipated that the availability of PA specialty crops would reach up to 35,000 students. Of the fifty schools projected to take part in the program, about 75% are high schools and 25% are elementary and middle schools. High schools represent the majority of sites because those sites are most likely to still furnish a fullservice kitchen, where fresh cooking takes place daily. Specialty crops were the sole focus of the farm to school procurement program laid out and the only foods purchased by the School District of Philadelphia from their specialty crop purveyor. The School District of Philadelphia regulated and monitored all produce purchased by its participating schools, by creating lists of fruits and vegetables schools were to purchase each week. All marketing and promotional tools created by Fair Food and the project team and all activities were dedicated to the promotion and consumption of specialty crops. Focus groups zeroed in on fruit and vegetable acceptance by students and their attitudes about consumption of specialty crops inside and outside the school environment.
Goals and	Evaluation: Eat Fresh Here completed 200 student surveys, conducted 3 youth focus groups, and interviewed

Outcomes Achieved:	cooks and managers from 12 of the program sites. The results are as follows: Youth Survey: • When asked how much of the local fruit or vegetable they consumed, 17% students responded that they ate most or all of the serving. 8% of students some or a little bit of the serving, 38% tasted the local food offering of the day, and 24% said they didn't eat any of it. Take home: Students are willing to try fresh fruits and vegetables, many eat at least some. Room for improvement: More students can try and should consume more fresh fruits and vegetables. • When asked how much they liked the fresh fruit or vegetable they tried that day, 22% "loved it," 46% "liked it," and 32% "didn't like it." Take home: Over 2/3 of students enjoyed the fresh fruits and vegetables they consumed. Room for improvement: We know that by January and February apple and pear quality was problematic for many schools; higher quality foods look and taste better to students. Additionally, acceptance of healthy foods in general by students needs improvement. • When asked if he or she would choose the locally grown item again, 54% said, "yes," 17% said, "maybe" and 29% said, "no." Take home: Over 70% of students would choose these items, demonstrating both interest in taking and trying locally grown foods. Room for improvement: Higher consumption and acceptance of these items among students can and should improve; marketing, presentation, and quality of foods is essential to improving these metrics. • When asked, if he or she were aware that their school was part of a special program bringing more fresh fruits and vegetables to their cafeterias, 80% responded, "no." If he or she did know about Eat Fresh Here, they were most likely to learn about the program through the EFH posters on display, or through a friend / schoolmate. Take home: Few students knew about the program, though the posters (visual marketing) proved somewhat effective. Further, the team believes that teacher engagement and coordination with Eat.Right.Now. could further help encourage students to choose, try, and return to healthy locally grown foods in the cafeteria. Finally, of those students that knew about the program, few understood that the local offerings came from local farms. Room for improvement: A coordinated marketing and messaging effort is needed, including use of posters and POS cards as well as better communication between on-site food services staff and their customers, the students. Youth Focus Group Results Youth focus groups took place in West Philadelphia at The Enterprise Center CDC, and at South Philadelphia High School. These focus groups were a joint effort between Fair Food, The Enterprise Center CDC, and the Southeast Philadelphia Collaborative. The aim of these focus groups was to better understand how students market and message concepts to their peers and to understand which factors were most important to them with respect to the choices they make every day on the lunch line. • Common themes regarding how students choose whether or not to take the school meal every day include the freshness, the presentation; whether or not it's something that appeals to them, and how appropriately cooked it looks (e.g. The pizza is always burned."). • Common themes regarding how they think about fresh fruits and vegetables include the general consensus that fruit was good; they liked it and chose it often. Vegetables were selected based upon appearance, smell, and whether or not things looked fresh. Salads are popular, as are broccoli, corn, and apples, and pears. • Common themes regarding why students choose healthy fruits and vegetables, when they do include their knowledge that it's good for them, the produce looks and smells good, and it helps with variety. • Regarding how students encourage their friends and peers to make better food choices, responses included simply encouraging their peers, to "try this," and importantly, to "try it" in front of their peers. Other students commented that repeated exposure to items is good, and that they would also remind their peers that if they're hungry, they should go for it. Finally, one student remarked that it works for him to say, "you know I'm picky, so

	if I like it, you'll like it." • Regarding how students get the word out about fun activities or events at school and how they would help promote Eat Fresh Here if given the opportunity, students reported that loudspeaker and classroom announcement were effective, as well as flyers, Facebook, texting, email, and simple word-of-mouth. Students indicated that taste-tests would really help promote the program and the idea of healthy eating as well as flyers, tee shirts, a school commercial for broadcast, or having an assembly. Take-away: Students noted that their own ways of communicating general ideas about lifestyle were typically effective, while acknowledging that talking with their friends about healthy foods was not easy. Students noted that the program would benefit from flyers and more word-of mouth. They also spoke about their desire to eat healthy foods, how choices could be difficult and how very important it is that the food look and smell inviting. Students were given postcard size Eat Fresh Here promotional cards for distribution to lockers, and in the cafeteria. We determined that in addition to producer/preparer education on the front end (cafeterias), how specialty crop choices are communicated to school audiences and the resources invested in promotional materials are crucial to obtaining desirable results. DFS Cook & Manager Interview Results Food Service Managers and Cooks were interviewed in May and June 2012 about their experiences with Eat Fresh Here. Twelve schools were represented in this interview and the results are as follows: Regarding use of locally grown foods in the cafeteria: • 11/12 sites served locally grown foods 3-5 times per week • 10/12 schools indicated that in their cafeteria over 50% of students choose the reimbursable meal at lunch • 7/12 schools noted that 75%-100% of students took the local item when offered as part of the meal • 10/12 schools indicated that NO servings of locally grown items were left at the end of the day Regarding kitchen operations: • Half of the schools indicated that time spent on food preparation increased because of Eat Fresh Here, however, most indicated that they felt adequately staffed to handle the extra work • 8/12 schools indicated that using locally grown foods increased their interaction level with students, and for those that did not, they noted that they were typically not working the line, so interaction was normally minimal • 10/12 schools said that their sense of pride and job satisfaction increased because of Eat Fresh Here On other effects of participating in Eat Fresh Here: • Half of the schools reported that Eat Fresh Here changed the way they ate in their own life for the better, while the other half noted that they already ate fresh fruits and vegetables • ¾ of schools reported that because of Eat Fresh Here they were more likely to talk with students about healthy eating or school food in general and all schools reported that they were more likely to talk with one another and their school's staff and colleagues about healthy eating because of Eat Fresh Here Open Feedback: "I love the program, because I love to cook!" "The fruit is very popular." "I wish we could have more variety!" "The lettuce was too dirty and the cases were too big." "The kids really loved the cherry tomatoes."
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. *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:	Expected Measurable Outcomes: The following are the outcomes for the entire grant period: 1. Sales of specialty crop by type, pounds, and the dollar values of these purchases. Benchmark: Sales data from 2010-2011 school year. For 2010-2011 school year, about $65,000 of locally grown specialty crops were purchased, which equated to about 60,000 pounds. Update: Approximately $46,000 of PA specialty crops Conclusion: Sales dropped during this school year in part due to restricted purchasing regulations and in part because the school ceased sourcing local food in late January due to a contract dispute between the School District of Philadelphia and its specialty crop vendor. While this was an unavoidable complication this past year, better planning and integration of contracts in the future will help to avoid future problems. 2. Student knowledge of Eat Fresh Here to assess effectiveness of in-school marketing campaign and youth-based messaging. Benchmark: Anecdotal information collected by PUFFA partners during 2010-2011 school years. Update: Four youth focus groups conducted in West and Southeast Philadelphia; repeat focus groups to take place in late May 2012. See evaluation section, above, for additional details. Conclusion: Program knowledge low, however key findings included visual marketing as a key strategy for engaging students, as well as social media, and utilization of existing school infrastructure. Promotion and communication of messages to target audience has a great degree of influence on impact of the program, so finding new ways to promote consistent messaging would enhance the program. 3. Student specialty crop preferences, based on sales trends and individual school assessments. Update: 200 student surveys conducted; see evaluation section, above, for additional details. Conclusions: Key findings include student's general willingness to try specialty crop offerings, high enjoyment / acceptance of specialty crop offerings, general willingness to select a specialty crop offering again, and a low awareness of the program in their school. 4. Student understanding of type, availability and health benefits of Pennsylvania specialty crops. Benchmark: Anecdotal information collected by PUFFA partners during 2010-2011 school year.

	Update: Three focus groups conducted in West and Southeast Philadelphia; see evaluation section, above, for additional details. Conclusion: Students expressed an interest in healthy foods that look, smell, and taste good. There was general acceptance of fresh items like salads and hand fruits, and continued feedback was reported to the DFS about batch cooking for brightly colored and fresh smelling cooked vegetables. 5. Division of Food Services understanding of type, availability and health benefits of PA specialty crops. Benchmark: Anecdotal information collected by PUFFA partners during 2010-2011 school year. Update: Interviewing of DFS staff ongoing. See evaluation section, above, for additional details. Conclusion: Division of Food Services staff reported a strong interest in serving healthy specialty crops to students and most reported consuming many specialty crops in their own homes to stay healthy. Knowledge of seasonality improved over previous school year, and recommendations for the 2012-2013 school year were collected. 6. Percentage of specialty crop sales increase from 2010-2011 school to increase by up to 10% during 2011-2012 school years. Benchmark: Specialty crop sales to Philadelphia schools for 2010-2011 school year. Update: Original estimates based on 50 schools in the program (double the 2010-2011 year). For 30 schools, purchasing closely matching sales from the 2010-2011 school year. Conclusion: Sales decreased by approximately 30% from the previous year (a 40% lower purchasing outcome than anticipated). Purchasing of specialty crops was lower than anticipated due to schools allowance to choose from a shorter list of specialty crops this past year (for better menu integration; a positive outcome!), fewer participating schools than anticipated, and a shorter purchasing period of specialty crops due to a contract dispute between the District and the local foods vendor.
Contact Person:	Contact Information Organization: Fair Food Primary Contact: Deborah Bentzel Mailing Address: 1315 Walnut Street, Suite 532 Philadelphia, PA 19107 Phone: 215-386-5211 x 102 Fax: 215-689-1567 Email: deb@fairfoodphilly.org
Additional Information:	Fair Food's staff attended the annual School Food FOCUS gathering in Chicago in May in order to better learn how the DFS could continue to integrate more specialty crops into their menus and operations, as well as best practices in procurement policy and contractings, and the new USDA meal pattern. The Program Manager also attended the Farm to Cafeteria Conference in Burlington, Vermont, where she, along with two colleagues from other large urban districts, presented upon effective collaborations in farm to school. Fair Food's presentation highlighted the collaboration between Fair Food, the Southeast Philadelphia Collaborative, PUFFA and The Enterprise Center as a way to engage youth about healthy eating, specialty crop acceptance, and best strategies for marketing and messaging to youth.

Project Title:	**Pennsylvania Vegetable Promotion Support, Project 20**
Project Summary:	The Pennsylvania Vegetable Marketing and Research Program is a state-wide marketing order created to allow all the growers in the industry to cooperatively fund practical vegetable research and promotion of locally grown vegetables, which the Program has done since its formation but with a very limited budget. Matching grants from the state for many years allowed the Program to expand its promotion efforts.

	One of the most successful parts of those efforts has been the Program's provision of "Simply Delicious" point-of-purchase materials to its direct-marketing growers. These professional-looking items such as price cards, price paddles, banners, binwrap, roadside signs, price stickers, aprons, shirts, hats, brochures and recipes cards are all designed to help growers clearly identify their produce as locally grown. With the current consumer interest in locally grown foods, it is profitable for growers to capitalize on this trend. Point-of-purchase materials were one of the first projects undertaken by the Program after its establishment in 1988 and one the Program has continued ever since. Matching state grants helped the Program expand its point-of-purchase effort for many years, but those funds are no longer available. In 2009 the Program was awarded a Specialty Crop Block Grant to assist the Program in continuing this effort and this project has further continued that effort. The Program has also developed a website to provide information on Pennsylvania vegetables to consumers. With the internet being the preferred source of information for many consumers, particularly younger consumers, it is important for the Pennsylvania vegetable industry to have a presence there. Currently, the www.paveggies.org website is one of the top results for Google searches for "PA vegetables" "PA veggies" and "PA vegetable recipes". Thus it is important to provide good consumer information in terms of recipes, nutritional information, selection and storage tips, and markets where local vegetables can be purchased. The recipes on the website are from the Program's own Pennsylvania Vegetable Recipe Contest. Information from the Program's brochure entitled "Pennsylvania Vegetables – Your Key to Good Nutrition" is available on the website to provide basic nutrition, selection and storage tips. The website was originally developed in house by the Program and was professionally reconstructed by the "No Chipped Paint" design section of Graphtech Printing in 2010 as part of the Program's 2009 Specialty Crop Block Grant. The reconstruction made the site much more professional-looking. They were also able to include more features. The grant has funded ongoing updates to the website.
Project Approach:	Since the distribution of point-of-purchase materials is an ongoing project of the Program, the Program has adopted the practice of purchasing several years' worth of individual items to take advantage of volume discounts because they are typically custom printed items. Items are valued at the cost plus a margin for shipping. Growers are allowed to order items totaling up to 50% of their annual assessment payment to Program up to a maximum of $25. If they wish order additional items, they must pay the amount over their 50% credit from their assessment payment. Any monies received over the 50% credit are used by the Program to help cover costs of shipping and purchase of future materials. Funding from this grant has enabled the Program to purchase the following point-of-purchase items for distribution to direct marketing growers: - design and production of 500 full-color 2'x4' banners (see additional information section); - purchase and printing of additional supplies of clip-on price card inserts; - purchase of additional stakes for roadside signs; - printing of 2,975 crop/message stickers for roadside signs; - printing of 5,000 copies of "Fun and Healthy Facts About PA Vegetables" brochures in 2013 and 20,000 in 2014; - design and production of 200,000 tee-shirt shopping bags; - printing of 9,500 each of eight recipe cards in 2013 and 5,000 each of eight recipe cards in 2014; - printing of 10,000 each of eight "How to Use" information cards for lesser known vegetables (beets, eggplant, kale, leeks, spaghetti squash, summer squash, Swiss chard, and winter squash); and - printing of 180,000 "PA Produce" price stickers. The following table outlines the distribution of point-of-purchase materials by the Program over the last five years:

	Orders	Orders	Orders	Orders	Orders	Inventory	Years of
	2010	2011	2012	2013	2014	2014	Supply
Banners	141	92	32	37	45	386	8+
Binwrap	200	125	117	104	111	88	<1
Restaurant Signs	16	36	20	16	12	96	7+
Signs	163	125	194	159	130	364	2+
Sign Stickers	1,093	825	1,329	935	812	3,648	4+
Clip-on Price Cards	113	99	136	119	139	88	<1
Price Cards	208	208	223	277	277	1,036	3+
Price Paddles Small	301	291	303	272	306	217	<1
Price Paddles Large	144	167	233	165	102		0
PA Pref Paddles Large				36	78		0
PA Veg Brochures	32	25	43	45	14	-	0
Fun Health Brochures	22	23	28	37	33	181	5+
Price Stickers	117	117	165	133	130	312	2+
Aprons	26	34	36	50	31		0
Shirts	74	60	101	90	82	27	0
Hats	44	24	32	40	4	(4)	0
Information Cards				349	327	924	2+
Recipe Cards Mixed	43	41	62	71	57	30	2
Card Racks	9	11	13	7	7	12	0
Total Number of Items Ordered (- Sign Stickers)	1,703,	1,478	1,738	2,007	1,892		
5–yr. Ave. of No. of Items			1,756	1,799	1,764		
Total Number of Orders	406	368	467	397	414		
5-yr Ave. No. of Orders			398	415	410		

The tee-shirt shopping bags were not delivered until October 2014, so they will be primarily distributed to growers at cost during the 2015 growing season. Hopefully they can be distributed through some of the produce auctions to avoid delivery costs. The plan will be to use the income from the sale of these bags to purchase inventory to maintain a continuous supply in the coming years.

In addition, the grant has helped fund the cost of shipping supplies (boxes, tape, etc.) and postage to ship these point-of-purchase materials to growers.

The Program's website, www.paveggies.org, was updated to include the Program's press releases for 2012 and 2013, information for Pennsylvania Produce Month, information about the 2012 and 2013 Vegetable Recipe Contests including the results from the Cook-Off. The information for growers available on the website was also updated, including the reports from the research projects supported in 2012 and 2013.

The total number of page views for the year from September 1, 2011 to August 31, 2012 was 10,769. The total number of page views from September 1, 2012 to August 31, 2013, was 13,386 or an estimated 24% increase in page views. For the period from September 1, 2013, to August 31, 2014, the number of page views was down to 11,404 or a drop of 15%. (This is assuming that the Program understands Google Analytics terms correctly. In

	2012, they presented page views while in 2013 they listed visitors and pages per visit. It is assumed that the number of visitors multiplied by the pages per visit should result in the number of page views.) The goal was to achieve at least a 10% increase in page views which was achieved the first year but not second year. The decline in the number of page views is very likely due to the Program's discontinuance of its press relations efforts in 2014 and radio advertising during the Program's August is PA Produce Month promotion. Both the press relations news releases on various crops and the radio advertising referenced the website. They apparently were successful in driving more traffic to the website during August. Most of the drop in traffic occurred during August, with 1,624 page views in August 2014 compared to 3,982 during August 2013, a 59% drop. The discontinuance of the press relations and radio advertising was part of the Program's restructuring of its promotions efforts whereby nearly all the Program's promotion efforts will be centered on an August Produce Month promotion. Social media is expected to be a part of that effort beginning in August 2015 and potentially along with advertising and press relations. Hopefully that will draw increased traffic to the website at least during August in future years. Google Analytics provides additional metrics that will require further study to determine which pages are visited most often and what changes should be made going forward. The page with the most page views is the list of markets where Pennsylvania vegetables can be purchased. The second most viewed page was the one listing the various wholesale produce auctions in the state. Both had increased visits in September 2013 to August 2014 compared to September 2012 to August 2013 even though overall page views were higher in 2012 to 2013 compared to 2013 to 2014. While the Program has historically viewed the recipes on the website as a major attraction, they do not seem to draw nearly as much traffic as expected. One reason may simply be that there are tremendous numbers of sites offering recipes available so the competition is intense. Given the interest in the market listings currently on the site, creating an updated list of farm markets and produce auctions for the site listing more complete information will be a top priority for the future. While the Program will continue to tout the website as a source of recipes, it will also point to the website as listing of markets where Pennsylvania vegetables are available.
Goals and Outcomes Achieved:	For the point-of-purchase portion of the project, the goal was to maintain or increase the volume of orders received from growers for the various point-of-purchase items. As shown in the table above, the total number of items ordered has been above the 5-year average of those numbers for the last two years. In terms of the number of growers placing orders, this year the number was just above the 5-year average whereas the number was below the 5-year average in 2013. The number was considerably higher than the 5-year average in 2012 due to the fact that the Program added a significant number of growers to its roll resulting in large increase in numbers for that year. While it would be desirable to see a continued upward trend, we are apparently at least providing materials that a certain segment of the grower population finds useful. Demand for the individual point-of-purchase items has varied across the 5-year period covered in the table above. The Program has not been able to discern a clear reason for this variation. The Program offers the items as long as supplies last and then determines whether it is worthwhile purchasing new supplies of the item. The restaurant signs will likely be phased out because there is limited demand for them. While there is not great demand for the brochures, the Program does distribute them to others besides growers. In particular the "Fun and Healthy Facts" brochure has been requested by teachers, nutrition advisors, civic groups and others, so additional supplies of them will be printed. A decision on whether to print a new version of the "Your Key to Good Nutrition" brochures is pending. It too was not real popular for growers but appreciated by other groups. The Program's clip-on price cards, vinyl price cards, price paddles, roadside signs, and price stickers have consistently been appreciated by growers over the years. The Program will be deciding whether to purchase new

	quantities of shirts and aprons in the future. Demand is somewhat limited and the decision will likely depend on the available budget. The future need for the Program to produce price paddles and price cards may be questionable as the state Department of Agriculture is producing these with the "PA Preferred" logo on them. These items are available to growers who are part of the "PA Preferred" program at no charge so the Vegetable Program may simply decide to distribute these items to our growers on behalf of the Department. The purpose of the point-of-purchase effort by the Program is to provide our growers with attractive, professionally printed materials that help the growers clearly identify their products as being grown in Pennsylvania. It has been our observation that this service is especially useful to our growers with smaller roadside farm markets or those who attend farmer's markets. Many of the larger farm markets have their own logos and pre-printed signs and shopping bags and thus, often do not use the Program's materials. The smaller growers, however, cannot justify the cost of custom printed materials individually and appreciate the Program's materials. As discussed above, the website did not achieve the goal of increasing the number of page views each year and this seems to be related to the elimination of coordinating promotion activities (press relations and Produce Month advertising) that were not part of the project. The Program will continue to maintain and improve the website in the coming years.
Beneficiaries:	This project was designed to potentially benefit the 3,500 vegetable growers of Pennsylvania by providing growers and marketers with professional-looking point-of-purchase materials that clearly identify locally grown produce as such, thus encouraging consumers to purchase it. The current consumer interest in "eating local" provides an excellent opportunity for growers and marketers to increase their market share of vegetable sales and these point-of-purchase materials assist them in that effort. Only the several hundred growers who actually ordered the point-of-purchase materials actually benefited from the project. The project also helped provide information about Pennsylvania vegetables to encourage consumers to purchase local produce through the website. The website has the potential to reach thousands of consumers across the state (and around the world). Moreover, the "How to Use" information cards, recipe cards and brochures produced as part of the point-of-purchase phase of the project also provided information about vegetables to potentially thousands of consumers.
Lessons Learned:	The banner that was designed and produced as part of this project is very colorful and attractive. It was a new design concept for the Program in that it did not use the "Simply Delicious" logo formerly used by the state Department of Agriculture and most of the Program's point-of-purchase materials. Instead, it used the state's new "PA Preferred" logo and a tagline of "Fresh Local Vegetables" (see picture below). This proved to be problematic in that individual growers must be licensed by the state to use the "PA Preferred" logo. Consequently, the Program must determine if the grower is part of the "PA Preferred" program before it can ship a banner to the grower. Most growers are not "PA Preferred" member which has limited the Program's ability to distribute the banners. The Program is working with the state to make it more convenient for growers to sign up for the "PA Preferred" program which is helping the situation, but it is still problematic. The Program had started to move away from using the "Simply Delicious" logo on new materials while using up inventories of "Simply Delicious" items on hand since the state has abandoned the use of the "Simply Delicious" logo. However, because the Program was so heavily invested in the "Simply Delicious" logo, this past summer the

state offered the Program the option to take over the state registration of the "Simply Delicious" logo. The Program followed through on this offer to at least protect its ability to use the inventory of "Simply Delicious" point-of-purchase materials on hand. The Program faces a decision on whether to start using the "Simply Delicious" logo on its newly produced materials again or to develop a new design for items, possibly with the "Fresh Local Vegetables" theme.

Another reason the banners have not been as widely ordered by growers is the cost. The Program had previously offered banners with the "Simply Delicious" logo on them which the state had given to the Program at no cost. Thus the Program was able to offer them at a nominal cost of $1. The new banners are a higher quality and are priced by the Program at $12.50 to cover the $11.90 cost plus a partial shipping allowance. Long term, the Program is looking to move the point-of-purchase materials distribution to a self-sustaining operation. However, it is uncertain whether growers will be will to pay the actual cost of the materials.

The Program ordered 500 of the banners but when they arrived, many were damaged because of the manner in which they were shipped. They were stacked flat on a pallet but the weight pressed the grommets into banners underneath causing marks. The supplier replaced at no cost about 200 of the banners as a result. Since the damaged banners were useable – particularly if they would be displayed where they would be viewed from a distance – the Program ended up with a surplus supply. Many of these second-grade banners have been distributed at no cost to county fairs across the state.

The "How to Use" information cards were offered in the 2013 season but due to delays in writing the copy and producing them, they were not distributed until the 2014 season. Obviously, that was poor planning on the part of the Program staff. In its 2014 annual fall survey the Program asked growers who ordered the cards if they were useful. Of the comments received so far, all but one of the comments about the "How to Use" information cards have been positive.

While including full-color pictures on these cards would have made them more attractive, it also would have made them more expensive. Furthermore, it was challenging enough to include all the desired information and a recipe on the 3" x 5" cards without a picture. The cards were printed on bright yellow paper to attract attention. Eight different cards were offered – beets, eggplant, kale, leeks, spaghetti squash, summer squash, Swiss chard, and winter squash. Cost savings were achieved by having all eight printed on one piece of paper and then cut into the 3" x 5" size (in other words, there was only one printing job instead of eight different press set-ups). The final cost was less than $1 per pad of 50 cards. However, the cards for leeks and Swiss chard have not been ordered by growers as often, so when the time comes to reprint, some adjustments will need to be made. The Program has asked growers for suggestions on additional crops for which the cards would be helpful.

The tee-shirt bags are another product that was not completed in a timely manner. The bags present a new magnitude of a point-of-purchase item because of their cost, bulk and the quantity that growers might potentially use. Moreover, while bags are a necessity for the growers, generic "Thank You" bags or even generic produce bags are readily available to them at very competitive prices. The Program's intent is to recover all the costs of the bags from the grower but it was necessary to have the funds to purchase the inventory of bags up front. By purchasing 200 cases, the Program was able to get the bags at a competitive cost. However, the weight of the bags makes it difficult to ship them and remain competitive. As stated previously, the Program hopes to work with the various produce auctions so the bags can be stocked at the auctions for pick-up by growers. The bags have one side printed in green with a custom design with the words "Fresh Local Vegetables" and "Pennsylvania Vegetable Marketing and Research Program" plus the Program's website. On the other side, the "PA Preferred" logo is printed in blue and yellow. The state Department of Agriculture is paying for the extra cost of including the "PA Preferred" logo.

Contact Person:	Project Coordinator: William Troxell phone 717-694-3596, fax 717-694-3596 pvmrp@embarqmail.com
Additional Information:	Banner Design  Roadside Sign with Sweet Corn Crop Sticker  "How to Use" Information Card Example – front and back

HOW TO USE KALE

- Kale cooks down dramatically so be sure to buy plenty.
- Store unwashed in an airtight container in the coldest part of the refrigerator for up to 3 to 4 days.
- To perk up limp leaves, trim the base of the stems and soak in lukewarm water.
- Thoroughly wash leaves and trim off stems and tough midribs.
- Blanching for 1 or 2 minutes in boiling water reduces bitterness and softens thick greens. Drain immediately and then run under cold water. Instead of blanching, kale can also be microwaved in a covered dish for 4 to 7 minutes.
- Blanched kale can be sautéed in a small amount of oil or stock and served like spinach or other greens.
- Kale can also simmered, covered, in a seasoned broth for 10 minutes or more or simply steamed for several minutes until wilted.
- Chopped, cooked kale can be mixed with grains such as rice or barley or added to soups, stews, beans or pasta sauces.
- Blend a few young chopped leaves without the stems into fruit smoothies.

Kale and Pine Nut Sauté

Serves 4

1 tablespoon olive oil
1/4 cup pine nuts
4 cups finely chopped kale, stems discarded
1/3 cup golden raisins
2 tablespoons chopped onions
1/4 cup water
1/2 tablespoon balsamic vinegar
1/4 cup shredded Parmesan cheese
salt and pepper to taste

Heat oil in large skillet or wok. Add pine nuts and stir-fry until golden brown. Add kale, raisins, onions and water. Cover pan and cook a few minutes until kale is tender. Add remaining ingredients and toss lightly. *Frances Dietz, York*

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Price Sticker

Recipe Cards Example – front and back

Asian Cucumber Salad

Serves 8

1/4 cup rice vinegar
1 1/2 teaspoons grated ginger root
salt and pepper to taste
2 tablespoons honey
3/4 teaspoon sesame oil
1 gourmet seedless cucumber, thinly sliced, not pared
4 green onions, thinly sliced
6 red radishes, thinly sliced
2 teaspoons sesame seeds, toasted
8 ounces lump crabmeat or cooked and peeled shrimp (optional)

Make dressing by combining the rice vinegar, ginger root, salt, pepper, honey, and sesame oil. Add the cucumber, green onions and radishes. Toss ingredients and allow to stand in refrigerator 10 minutes for flavors to blend. If using crab or shrimp, it should be added to salad just before serving. Divide salad among bowls and garnish each with toasted sesame seeds.

Frances Dietz, York
First Place Prize Recipe – Melons/Cucumber Category
2012 Pennsylvania Vegetable Recipe Contest

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

Printed with a Specialty Crop Block Grant from the Pennsylvania Department of Agriculture

Pennsylvania Vegetable Marketing and Research Program

Custom Design for Tee-Shirt Bags

"Fun and Healthy Facts about Pennsylvania Vegetables" brochures – trifold format

For good health . . .

Eat 3 to 5 vegetables each day.

- tomato juice, cantaloupe or watermelon for breakfast
- carrots & celery or salad for lunch
- potato & 1 or 2 other vegetables for supper
- watermelon for dessert or snack

Eat vegetables with different vitamins each day.

- one vegetable high in vitamin A *(broccoli, cantaloupe, carrots, lettuce, peppers, spinach, or winter squash)*
- one vegetable high in vitamin C *(asparagus, snap beans, lima beans, broccoli, Brussels sprouts, cabbage, cantaloupe, cauliflower, lettuce, peas, peppers, spinach, tomatoes, turnips, watermelon or winter squash)*
- one vegetable high in fiber *(lima beans, beets, broccoli, Brussels sprouts, cabbage, carrots, cauliflower, peas, potatoes, sweet corn or winter squash)*

Eat a vegetable from the cabbage family several times a week.

(broccoli, Brussels sprouts, cabbage, cauliflower, collards, kale or turnips)

It all adds up . . .

Vegetables are grown on over 3,950 farms in Pennsylvania

major crops	2012 acres	national rank
• asparagus	150	
• beans, snap	10,720	5th*
• beets	110	
• broccoli	320	
• cabbage	1,090	13th**
• cantaloupe	1,120	8th**
• cauliflower	110	
• cucumbers	340	
• leafy greens	220	
• onions	140	
• peas	120	
• peppers	1,240	
• potatoes	8,660	21th
• pumpkins	6,190	4th
• squash	950	
• sweet corn	12,720	7th**
• tomatoes	2,660	13th**
• watermelon	760	
• other vegetables	1,780	

* = processing ** = fresh market

Rank the vegetable crops in order of the number of acres grown.

Add up the total number of acres of vegetables grown in Pennsylvania.

Calculate the average acres of vegetables grown on each farm.

Cover photo is Abigail Beinlich from Triple B Farms in Monongahela, Pennsylvania.

Fun and Healthy Facts about Pennsylvania Vegetables

PENNSYLVANIA
Vegetable Marketing
& Research Program

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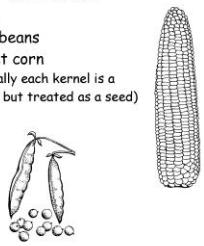
www.paveggies.org

PA Preferred
Grown in PA. It makes a difference.

Not all vegetables are the same...

Some are seeds

- peas
- lima beans
- sweet corn (actually each kernel is a fruit but treated as a seed)

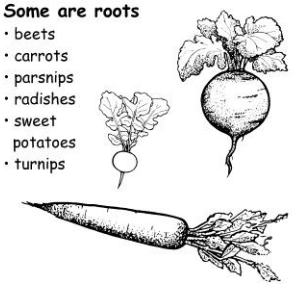


Some are seed pods

- snap beans
- sugar peas

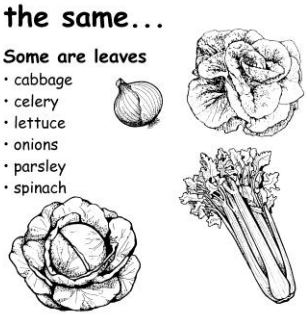
Some are roots

- beets
- carrots
- parsnips
- radishes
- sweet potatoes
- turnips



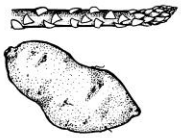
Some are leaves

- cabbage
- celery
- lettuce
- onions
- parsley
- spinach



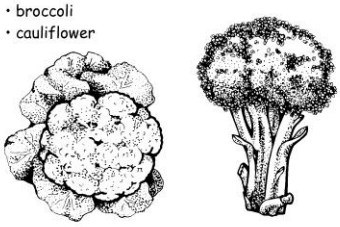
Some are stems

- asparagus
- potatoes (a tuberous underground stem)



Some are flower buds

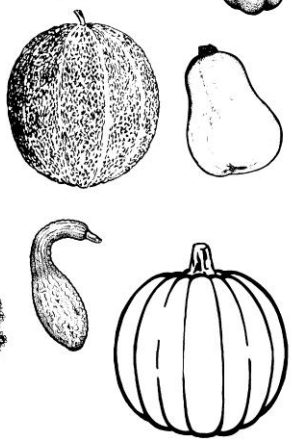
- broccoli
- cauliflower



And some are really fruits

- cantaloupes
- cucumbers
- eggplant
- peppers
- pumpkins
- squash
- tomatoes
- watermelons

(but for dietary purposes all except the melons are considered vegetables)



Project Title:	**Expanding Markets for Regional Specialty Crops: Building a Food Hub in Northeastern Pennsylvania, Project 25**
Project Summary :	This project was to plan and implement development of a Northeast Pennsylvania "food hub" designed to increase the production and sales of northeast Pennsylvania-grown specialty crops. This comprehensive effort, led by PASA, was a collaboration engaging The University of Scranton Small Business Development Center (SBDC), Fair Food, Keystone Development Center, and Endless Mountains Farm Fresh. *(Note: In the winter of 2012, Endless Mountains Farm Fresh ceased operations for a variety of reasons. A new project partner was determined; a group of Wayne County growers led by Eusebius (Sky) Ballentine (Anthill Farm) known as the Beech Grove Farmers Co-op.)* Project elements included: 1) a pre-assessment of existing "food hub"-related resources; 2) a feasibility study to determine consumer and wholesale demand; 3) producer training and education on food safety, crop selection and marketing to maximize profit; 4) consumer outreach campaign to increase sales through public events, mailings, media, and web utilizing the widely recognized Buy Fresh Buy Local® brand. An increased sale of specialty crops was the project's primary goal. Farmers in the northeast region are struggling to reach buyers and have asked for professional help to promote and distribute their products. Most vegetable growers in this area have less than 5 years farming experience and some have less than 2 years. These new farmers in Susquehanna, Wayne, Wyoming and Bradford counties are producing salad and hardy greens, broccoli, heirloom tomatoes, Brussels sprouts, eggplant, artichokes and more. Many of these growers are small and diversified, with some cultivating up to one hundred specialty crop varieties on fewer than 15 acres. However at this early stage, they face many challenges: undeveloped markets in a sparsely populated region, high transportation costs to reach more mature markets, lack of marketing skill, absence of coordinated production planning, little training in food safety, and competition from more established market growers in nearby states. Meanwhile, demand for local food continues to grow. Northeast Pennsylvania, which is less than four hours drive from 11 million eaters in communities from New York to Philadelphia, has the potential to become a significant specialty crop production center. As an effective "food hub", specialty crop growers would benefit from appropriate production assistance, marketing mechanisms, and infrastructure support to facilitate essential functions of planning, aggregation, storage, processing, and distribution.
Project Approach:	**Analyze Existing Food Hub Resources** Anthill Farm was provided with articles and webinar information related to creating food hubs, sustainability and social responsibility gaining importance in the foodservice industry, the resurgence of heirloom foods, suggestions on value-added products, establishing farmers markets in hospitals, and farm to school programs. Additionally, project partner, the University of Scranton Small Business Development Center (SBDC) sent clients information on the U.S. Department of Agriculture program providing new capital to rural small businesses in agriculture-related industries. **Consumer Survey** The SBDC distributed a consumer questionnaire to gauge interest in local food purchases.

Food Establishment Survey/Roundtables

The SBDC continued to work on gauging interest in local food purchasing by food establishments, more specifically restaurant chefs and owners.

Fair Food Philadelphia Training

Through the coordination of project partners Fair Food Philadelphia, Pennsylvania Association for Sustainable Agriculture (PASA), and Sky Ballentine, a program entitled "Selling Direct to the Wholesale Marketplace" was presented on March 18, 2013 at The Cooperage in Honesdale, PA.

Food Hub Feasibility Study

The information gathered from the consumer surveys, business surveys, and roundtable discussions was compiled and a feasibility report was written and sent to Anthill Farm.

Consumer Education / Public Outreach

As the Buy Fresh Buy Local® Northeast Chapter coordinator, the SBDC created a local food guide, an English version and a Spanish version, and distributed it to area agencies. The guides were distributed to those agencies serving a high proportion of WIC and SNAP recipients.

Project Summary(as detailed above)
Tasks and activities performed

- Pre-assessment of existing food hub related resources
- Feasibility study to determine consumer and wholesale demand for produce
- Producer training and education on food safety, crop selection and marketing to maximize profit
- Consumer outreach campaign to increase sales

Unusual Developments
Endless Mountain Farm Fresh ceased operations and a new project partner was identified. Anthill Farm and Beech Grove Farmers Coop stepped in to work on this project.

Despite several attempts at different methods of outreach, it was difficult to engage participants of the SNAP and WIC programs.

Recommendations
Specific recommendations related to this work is that the Coop needs to increase their marketing efforts, including social media and public relations. The public needs to become aware of who the coop is, what they have for products and where to find them. It is recommended that they increase participation in farmers' markets and CSA growth.
To increase the customer base of wholesale markets, they need to organize a Field Day on the farm and invite area restaurant owners and chefs to attend.

Accomplishments
A published Local Food Guide, both in Spanish and English, which promotes and markets the many farmers markets, farmers, growers, retail markets, restaurants, wineries and creameries in the area is a tangible

	accomplishment of the grant work. Also, Anthill's revenue increased 54% in 2013 and showed profits in 2013 and 2014 after several years of financial loss. Anthill is now a stronger, more profitable venture extending its reach throughout the region with its produce sales.
Goals and Outcomes Achieved:	**Consumer Survey** The University of Scranton Small Business Development Center (SBDC) compiled a list of 400 potential retail and wholesale buyers in the Scranton area, including restaurants, grocery stores, and specialty food providers. They distributed a consumer questionnaire to gauge interest in local food purchases. The business consultant and an intern attended the Cooperative Farmers Market of Scranton on November 16, 2012, and handed out the questionnaire, which over 20 people completed. These surveys were also distributed at the Lackawanna College Wellness Fair. For their time the survey respondents were given a letter size vegetable planting timetable whiteboard or a reusable water bottle, courtesy of the Buy Fresh Buy Local® Northeast Region Chapter. With the outreach described and online distribution, 69 individuals completed the survey. **Food Establishment Survey/Roundtables** The SBDC continued to work on gauging interest in local food purchasing by food establishments, more specifically restaurant chefs and owners. Surveys were emailed to restaurants, posted on the Small Business Development Center Facebook page and given out to attendees of our roundtables. 16 individuals completed the survey. In addition, in our attempt to assist the Anthill Farm and the other farmers in Wayne County interested in establishing the farmer cooperative, we decided that hosting discussions between restaurant chefs and owners and the farmers would assist in gathering ideas, assess purchasing interest and help establish a food hub in Northeastern Pennsylvania. The business consultant and Eusebius (Sky) Ballantine decided to hold two Farm to Table Roundtable discussions. We initially planned to host one at the Abington Community Library, Clarks Summit, PA (Lackawanna County), and one in Luzerne County at the Center for Innovation, Wilkes-Barre, PA (Luzerne County). Our sister organization, the Wilkes University Small Business Development Center was able to assist us with the arrangements for the event held in Wilkes-Barre. We had to cancel the first one due to inclement weather and rescheduled. We compiled a list of restaurants we thought would have an interest in buying local produce from our group of Wayne County farmers. We sent out invitations via U.S. mail and email, we followed up with telephone calls and reminder emails. In the end we conducted three round tables: Date — Location February 11, 2013 — Wilkes-Barre, PA February 25, 2013 — Clarks Summit, PA

April 22, 2013 Scranton, PA

During these roundtables we learned that restaurant owners are very interested in sourcing their vegetables, chicken and beef from local farmers. They have a desire to work with local farmers. Their clientele are asking about local foods and they are interested in ordering locally grown items when they are featured on the menu. Chefs are very busy and while they like the quality they see from farmers their concern is that the delivery and quantity must be consistent. They would like to have local produce year round. Sky assured them that it his intention to use his root cellar and encourage all the farms to do likewise.

Chefs are willing to pay more for organically grown but their main concern is locally grown and then naturally grown. Products offered to chefs do not all have to be organically grown. We learned that many do attend local farmers markets to pick out locally grown items but that they consider it an extra step, one they would like to avoid.

Restaurant chefs want to be contacted by telephone or email. They would like their deliveries before the start of their busy weekends. Their packaging requirements may change as they start ordering larger amounts. The chefs that attended the roundtables who currently order from Sky and his group of farmers are very pleased with the quality, the pricing and the service they receive.

The SBDC has provided Anthill Farm with the lists of all the restaurants and their contact information, which had been compiled for the purposes of the roundtables. This list has over 25 restaurants.

All of this information was added to the final feasibility study document.

Fair Food Philadelphia Training

Through the coordination of project partners Fair Food Philadelphia, Pennsylvania Association for Sustainable Agriculture (PASA), and Sky Ballentine, a program entitled “Selling Direct to the Wholesale Marketplace” was presented on March 18, 2013 at The Cooperage in Honesdale, PA. 30 growers took part in this workshop. The SBDC was able to assist by sending invitations to all the farmers in their database. This workshop instructed farmers how to safely and profitably plan for, pack, price and market specialty crops to retail, wholesale and school system buyers.

Food Hub Feasibility Study

The information gathered from the consumer surveys, business surveys, and roundtable discussions was compiled and a feasibility report was written and sent to Anthill Farm. The SBDC assisted the owners of Anthill Farm/Lackawaxen Farm Company in writing a business plan. This was their first attempt at creating a business plan. The SBDC also completed accompanying financial projections for a three-year time period using a multi-scenario approach to obtain realistic income and profit figures.

Farmers planned to raise $20,000 in startup funds from relatives in order to launch their food hub aggregation and distribution business. We identified the Winrock Foundation/ Good Food Network Grant for Food Hubs program. We suggested Anthill Farm look into this funding. We suggested they look at the webinar before they attempted to fill out the application. We reviewed the website, eligibility requirements, documentation and the

accompanying information in order to prepare the SBDC to assist the client in his application process.

Information was sent to the farmers from Penn State Agricultural Service on the growing of blueberries, onions and peppers.

Consumer Education / Public Outreach

As the Buy Fresh Buy Local® Northeast Chapter coordinator, the SBDC created a local food guide, an English version and a Spanish version, and distributed it to area agencies. The guides were distributed to those agencies serving a high proportion of WIC and SNAP recipients. The Local Food Guide can also be found on the SBDC's website: scrantonsbdc.com/bfbl/

The agencies and groups include:
Leahy Clinic, University of Scranton
United Neighborhood Centers – Olive Street Complex, Cedar Avenue Offices
PA Department of Public Welfare, Lackawanna County Assistance Office
Employment Opportunity Training Center, Scranton, PA
Marywood University
Lackawanna College
Scranton Cooperative Farmers Market
Monroe Farmers Market
Dansbury Farmers Market
University of Scranton, Center for Service and Social Justice
University of Scranton, Office of Equity and Diversity
Schlitter Farm
Goulds Farm
Cherry Valley CSA at Josie Porter Farm
Southside Scranton Farmers Market
Clarks Summit Library
Maternal and Family Health Services, Wilkes-Barre, PA

The SBDC met with Cindy Matthews, Wayne County Administrative Entity – Office of Behavioral and Developmental Programs and Early Intervention. She has run a small program where she has placed several of her intellectually disabled high school students on farms as employees. She is trying to get more farmers interested in these efforts. She has also coordinated the purchasing of produce from a local farmer by a county agency, the Area Agency on Aging. She is trying to expand this program as well. We are assisting her as part of our efforts to create a local food hub in Wayne County.

A SBDC representative attended the annual Northeast PA Vegetable Growers Association Meeting in January 2014. Information on the SBDC and the Carbondale Technology Transfer Center (CTTC) Kitchen Incubator was presented. We gathered material distributed at this training session for our farm clients, sent it to them and provided them with key contacts within the Penn State Extension program and with a consultant doing Good Agricultural Practices (GAP) certification counseling.

	Representatives from the SBDC attended the Wayne County Dairy Day/Ag Day as an exhibitor. The day was spent at Honesdale High School, Honesdale, PA, distributing information about agricultural business opportunities. The SBDC was invited to participate in a program sponsored by the farmers, our clients, the SEEDS organization (Sustainable Energy Education and Development Support), the Cooperage Project, and the Wayne County Employment Coalition. This public event was organized to gather support for the Wayne County Food Hub initiative. The farmers spoke about their involvement in building a local food hub, working with 20 other farms, their experience selling out of the area in New York City, working with local restaurants, and their plans to hold quarterly meetings with fellow farmers to improve production, efficiencies, etc. There were over 55 people in attendance at this Food Hub formation event. The public heard guest speakers from the County Area Agency on Aging, the Wayne County Conservation district, the Wayne County Employment Coalition, local farmers, etc. A power point presentation on the topic of what is a food hub and its economic, social, and environmental impact on the area was shown to the group. At the event, the SBDC distributed their food guides, information on the importance of eating local, eating foods in season, and recipes showcasing local food. In advance of the event we spent time gathering recipes and formatting them into recipe card format. We copied the informational material from our library. The local newspaper was there and we were able to speak to the reporter about the benefits and importance of eating local food.
Beneficiaries:	The SBDC visited The Anthill Farm, in Prompton, PA. The farm is situated in Wayne County. They are a non-certified organic farm. The Anthill Farm covers 35 acres and they farm 8 acres for their vegetable production. They have a 150 member Community Supported Agriculture (CSA) operation. They have an orchard of fruit and nut trees as well. They have hoop houses on their property as well as 625 square foot root cellar. We conducted an existing business needs assessment to determine the areas in which they need assistance. Anthill Farm wants to form a producer's cooperative modeled after the Lancaster Farm Fresh Cooperative. They have five other vegetable farmers in the area that are interested. They recognize that they need an ordering system, distribution and transportation system in place. They envision that the coop administrator would take a 25% fee for coordinating the ordering and distribution. The SBDC provided Anthill farm with information on farm recordkeeping, an employee policy and procedures manual, articles on winter farmers markets, and information on specialty food production. In addition, Sky scheduled a meeting with the Keystone Development Center and the SBDC was able to locate a meeting space on campus to host the meeting. Ms. Peggy Fogarty Harish met with a group of ten farmers and ran a 2.5-hour session on Packaging Your Produce for the Wholesale Market. Financial Information

Anthill Farm

	2012	2013	2014 (projected)
Sales	$30,000	$85,000	$188,500
Expenses	$5,000	$20,000	$43,776
Profit	($1,000)	$1,500	$12,773

The University of Scranton Small Business Development Center began working with the Anthill Farm in October of 2012. They were a small farm looking for new opportunities to sell their local produce. During the period in which we assisted them, their revenue increased by 54% in 2013 and it is projected to increase by 120% in 2014. Anthill Farm's expenses rose by 75 % from 2012 to 2013 and the following year it is expected to increase by a smaller margin, 54%. In 2012 the farm was operating at a loss. Profits increased in 2013 by $2,500 and in 2014 they are projected to be $11,273.

During the course of the client engagement we were able to assist the client in identifying and capitalizing on these new revenue streams. Anthill Farm has become a stronger, more profitable venture since working with The University of Scranton Small Business Development Center.

Based on The University of Scranton SBDC assessment of the local market for the local foods grown and produced by the Beech Grove Farmers' Co-op, it is believed that a market exists. Continuing their efforts to sell to consumers using a CSA format and through farmers markets is strongly supported.

To reach the two target markets, the Co-op should increase its marketing efforts. Efforts for promoting their Coop should include using social media and public relations. The Co-op has to let the public know who they are, what they have to offer and where to find their products. The SBDC suggests the Co-op seriously consider getting a booth at the Cooperative Farmers' Market in Scranton.

In addition, there also exists a wholesale market for the agricultural products of Beech Grove Farmers' Co-op. To expand their wholesale customer base the Co-op should organize a Field Day on the farm and invite many area restaurant owners and local chefs to attend. They should consider compiling a marketing plan with a set of activities that would include making sales calls on chefs with their produce in hand. They may also want to set up a referral system and offer discounts or special limited items to chefs as a thank you in exchange for the referral.

Two specialty crop growers from Northeast Pennsylvania were also given a scholarship to attend the annual PASA *Farming for the Future* Conference in February 2013.

Lessons Learned: Project partners the SBDC and PASA found it difficult to engage and reach participants in the SNAP and WIC programs in Northeast Pennsylvania, as they were initially a target market in this grant for increased consumer education around specialty crops.

Contact Person:	Name the Contact Person for the Project: Michele Spencer, Membership Director Telephone Number: 814-349-9856 x17 Email Address: michele@pasafarming.org
Additional Information:	Provide additional information available (i.e. publications, websites, photographs) that is not applicable to any of the prior sections. ***Also Included:*** Local Food Guide Feasibility Study

Project Title:	**Direct Farm Sales Program, Project 26**
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 non-profit 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, 2012 through September 30, 2012. There were a total of 54 applications for the 2012 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:	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. Projects were required to target underserved areas defined as the following: a low income or moderate income census tract, an area with below average supermarket density, and area having a supermarket customer base with more than 50% of the customer base living in a low-income census tract or other area demonstrated to have a significant access limitation due to travel distance. Once projects 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.

	Projects were required to submit a final report attaching examples of all promotional materials distributed, promotional materials must feature specialty crops or they will be considered unallowable. 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. Farmers markets or farm stands where not considered for funding unless they accepted Farmers Market Nutrition Program (FMNP) checks and were able to provide data regarding the number of checks redeemed. Projects were scored and chosen based on their ability to accomplish the goals listed below; 1. Increasing the number of outlets in underserved areas, 2. Creating awareness of Pennsylvania farm stands and farmers' market outlets, 3. Increase child and adult nutrition knowledge and consumption of specialty crops, 4. Increasing the FMNP redemption rate for Pennsylvania produce. 5. Increase the number of PA Preferred producers participating in the program. Summaries from some of the mini projects goals and outcomes are shown below.
Goals and Outcomes Achieved:	The goals and outcomes that were achieved by each grantee are listed separately below. 1. Ferry Street Growers Market had several goals they worked on accomplishing with this project. Some of the goals were totally achieved like to promote PA locally grown produce, completing a customer satisfaction survey, increase the number of customers at the market and sales at the market, and provide nutritional information to customers. The achievement of these goals directly resulted in the increase consumption of specialty crops. 2. The Beaver County Farmers Market Associations goals were to increase customer attendance at markets by using various forms of advertising and promotion, and increase the number of food demonstrations. 95% of the farmers that sell at this market sell specialty crops and some of those that don't used specialty crops within the products that they are selling. The increase customer attendance therefore directly impacts the competitiveness of specialty crops at this market. 3. The primary goals of the Lititz Farmers Market were to increase the number of patrons and to strengthen the quality of the vendors at the market. The increase of patrons resulted in a significant increase in sales with specialty crop vendors. A cut flower producer saw a big bump in sales this year. 4. Goodell Gardens Farmers Market used grant funds to purchase feather market signs which attracted many new shoppers to the market. Customer surveys showed that they came to the market because they saw the feather signs. Specialty crop vendors directly benefitted from the increased customer traffic. Specialty Crop vendors make up the majority of vendors at the market. Grant funds were also used to purchase and staff a tent which contained nutrition education materials and provided the setting for a cooking demonstration on Customer Appreciation day. The market was also able to accomplish their goal of increasing the number of customers by 200 during the market season. 5. Lansdowne Farmers Market used a combination of signage, web design, social media and print advertising to meet their goal of increasing the consumption of fresh locally grown healthy produce

among Lansdowne residents. Marketing efforts resulted in four new specialty crop vendors selling at the market. Also an existing specialty crop vendor increased their stall space and variety of specialty crops offered for sale at the market. They were also able to increase the FMNP use at the market with targeted marketing. Overall specialty crop sales were up at this year's market compared to the previous year.

6. Flemings at Shady Brooke Farm was able to increase community awareness of the benefits of locally picked produce with advertising and promotional materials. The increase of patrons resulted in a significant increase in sales with specialty crop vendors. They purchased an ice bin which gave local growers the ability to keep produce fresher longer. They were also able to complete their goal of increasing FMNP check redemption. Redemption at their location increased by 12%. Besides growing their own produce they also purchase and resell produce from 40 local growers.

7. Green Pasture Farms project goals and outcomes were to create and promote a local farm market in an underserved area of Pennsylvania. Increase CSA customers by adding 67 new customers. They substantially increased consumption of specialty crops in a food desert area of eastern Pennsylvania.

8. Wolff's Apple House was successful in accomplishing their goals of reaching new customers, educating customers and locally grown produce. Funding made it possible for Wolffs to advertise the benefits of locally produced apples and increase the radius of farms selling specialty crops at their market. Wolffs Apple House sells a wide variety of fruits and vegetables from farmers within a 50 mile radius of the store. They also sell annuals, perennials, Christmas trees, herbs, and mums.

While the goal of increasing FMNP checks redeemed from 75% to 80% throughout the state is not known at this time because the program year has not yet been completed. 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 did not achieve our goal of having 100 applications for the mini grants for this grant period. There were only 54 applications this year with 31 mini projects being awarded funding this year.

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. At the end of 2012 there were 65 specialty crops vendors enrolled in the PA Preferred program. We will use this as our bench market for future programs.

Some project outcomes are as follows:

1. The Collegeville Farmers Market objective was to increase the market attendance and consumer awareness of the economic and health benefits of local produce and the importance of supporting local agriculture. The market accomplished this utilizing a weekly newsletter that highlighted fruits and vegetables that were in season at that time. They provided community residents with flyers containing the benefits of local produce. Seminars were conducted at the market by Cooperative Extension Master Gardeners and activities were provided for children to learn about the importance for composting and planting vegetables and flowers. The market increased by approximately 30 consumers each market.

2. Hurry Hill Maple Farm was able to update their website several times during the project to include nutritional information. They created the Pure Pennsylvania Maple Syrup: A HEALTHY Change!

	Brochure (attached) and distributed it to customers. Tables were purchased and used in the Discover Maple Room. 3. Penn Street Market was able to create bi-lingual signage utilizing grant funds to provide a much needed form of communication with community residents. The market was also able to implement a wireless EBT program at the market. Recipients purchased $830 worth of specialty crops with this benefit. 4. Weavers Orchard created a larger education space for its honeybees. Educated consumers about their farming practices and growing apples. Held a number of cooking demonstrations utilizing locally grown produce and taught consumers how to can and preserve jam, peaches and salsa. 5. The Carbondale Business Association was able to attract additional consumers to their market, which resulted in the farmer increasing the number of days selling at the market from 2 days to 3 days. 6. Boyertown Farmers Market utilized advertising to attract additional consumers to the market and was able to hire a part-time market manager who successfully attracted additional specialty crop farmers to the market, which resulted in these farmers having an additional avenue in which to market their specialty crops. 7. Nev and Nise Produce utilized television advertising to attract new customers to their farm stand and a new farmers market they are attending. This advertising helped bring customers into a newly opened farmers market, which benefitted all of the specialty crop vendors. Many of the customers commented on seeing the commercial on T.V. 8. Pittsburgh Public Market used cooking demonstrations to increase awareness of local farm product, how to cook them and teach how assessable they are. Cooking demonstrations all featured a specialty crop item currently in season and available for purchase at the market. When ask what could be done to encourage customers to purchase more produce they were told to continue demonstrations during the winter featuring rutabaga, turnips, and daikon radishes, which are less familiar than summer produce and more recipes using local farm ingredients. The market worked with senior living facilities to arrange trips to the market for senior to use their FMNP checks. 9. Farm to City used weekly e-newsletters to patrons, flyers to residents and businesses and cooking demonstrations to promote the Dickinson Square Farmers Market. They had 356 people sign up to receive the e-newsletter and brought large crowds to the market. The e-newsletters kept customers up-to-date on what specialty crops the farmers were selling at market each week. This made the market more competitive since customers knew in advance the fruits and vegetables they would be able to buy. The newsletters also highlighted certain crops and included recipes on how to use them. 10. Nurture Nature Center promoted 14 producer-only farmers markets in the Lehigh Valley using advertising, canning demonstrations, e-newsletters, and social media. This effort increase the attendance of new customers at all of the markets 11. The Food Trust used flyers and social media, and worked with the local WIC office to increase the usage of SNAP and FMNP benefits at the Broad Street and Snyder Avenue Farmers Market. The focus was to increase SNAP usage on fresh locally grown produce. They accomplished with by utilizing a nutritionist and by providing nutrition education materials. This was a new location for the market this year. The new location and promotion created a successful market season.

Some of the goals and outcomes that were not achieved by grant recipients are listed below along with future project plans.

1. Enon Country Garden wasn't able to accomplish all of their goals due to a fire and weather issues. They are going to be learning from their mistakes and continue to try new things in the future. Due to a fire in the greenhouse the first goal of revamping the greenhouse was unable to be accomplished. The second goal of extending the market season also nixed due to the fire. The third goal of educating individuals regarding seasonal specialty crops and how to prepare them was accomplished by the distribution of 3,600 information packets and a facebook page. The information packets covered four specialty crops; onions, cabbage, beets and sweet potatoes. The information included health benefits, selecting and storage tips, preparation tips and recipes.

2. Ferry Street Farmers market had two goals that they didn't entirely achieve. Customer surveys indicated that they would like more vendors at the market, which they were able to add a few new vendors, but customers would still like more. The market also doubled the number of FMNP checks redeemed, but think they can still do better.

3. Beaver County Farmers Market Association continues to struggle with scheduling cooking demonstrations at the market due to weather, time and materials. When these demonstrations have occurred there is a definite increase in the sales of the produce demonstrated.

4. The Lititz Farmers market was not successful in attracting SNAP users who use the markets through marketing efforts. They are planning to continue to market to SNAP users in the 2013 season. The market only had one machine for the entire market and gave tokens to use with the different vendors because of this it wasn't possible to determine the SNAP usage for specialty crop consumption. Next year the market will work on ways to better track redemption of SNAP benefit for specialty crops.

5. Penn Street Farmers Market was able to attract 1 more specialty crop farmer to their market, however there is reluctance among all types of farmers and vendors to come in the City of Reading due to safety and low-income issues. The FMNP and SNAP program are helping to increase income for specialty crop farmers at the market, but keeping vendors remains a challenge.

6. The Carbondale Business Association was not successful in attracting farmers to use the CTTC kitchen incubator for production of value added products.

7. Main Street Washington Farmers Market was able to attract a larger attendance at the market this year and increased use of SNAP and FMNP benefit use at the market. This resulted in an 85% increase in specialty crop consumption. The SNAP benefit redemption at the market increased by 50% over last year. 65% Of the total SNAP redemption was for the purchase of specialty crops.

Note: There was one project which was not completed this year because the grant we funding available was not enough for the project to be completed. The projects did not receive any specialty crops block grant funds since they did not submit any receipts for reimbursement.

Total program goals

	Goal 1: To increase the number of outlets in underserved areas Target: Add 5 new markets in underserved areas Benchmark: In 2011 there were 1,389 farmers markets and farm stands Performance Measure: At the end of 2012 there were 1086 The reason to the large change was due to the database being clean up with location that are no longer open being deleted and farmers retiring and no longer operating their farm stand. Goal 2: Creating awareness of Pennsylvania farm stand and farmers' market outlets Target: We did not include a target for this in our proposal Benchmark: in 2011 market sales of specialty crops was 1,493.3 million pounds Performance measure: Sales information for 2012 is not available at this time. Goal 3: Increase child and adult nutrition knowledge and consumption of specialty crops Target: We did not include a target for this goal in our project proposal. A target would be 5 Benchmark: Without the Direct Farm Sales there are not any markets offering nutrition education to children and adults Performance Measure: The mini grants provided some form of nutrition education at 12 different markets. This included printed information and cooking demonstrations utilizing specialty crops Goal 4: Increase the FMNP redemption rate for Pennsylvania produce Target: Increase the FMNP checks redeemed from 75% to 80% Benchmark: The FMNP check redemption in 2011 was 71% Performance Measure: The FMNP check redemption in 2012 was 69%. Goal 5: Increase the number of PA Preferred specialty crops producers participating in the program Target: In our proposed project we did not include a target this year. Benchmark: We did not have a benchmark to use for the 2012 program. The benchmark we will use going forward is 65. Performance Measure: The number of registered PA Preferred vendors at the end of 2012 was 65
Beneficiaries:	Over 99,097 people benefited from this year's Direct Farm mini grant projects. This number doesn't include the number of farmers and other vendors that benefited 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 2012 were 75. Some of the projects were unsure if any of their vendors belong to the PA Preferred program. There were approximately 14,351 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. One grant recipient commented that once some of the FMNP recipients used their FMNP checks they never see them again while others have found a community resource that they weren't aware of. One market's vendors reported that 15- 20% of their weekly sales was with FMNP checks. Note many of the projects were not able to compile this information since the individual farmers accept the checks at the market.
Lessons Learned:	The following are lessons learned that our projects shared with us in their final evaluation reports: The biggest lesson that Collegeville Farmers Market learned was that increasing public awareness takes time

	and that they will need to continue their efforts each year. Hurry Hill Maple Farm learned that they need to educate consumers on the many used of pure maple syrup. Boyertown Farmers Market learned that it was important to bring in new volunteers with fresh idea to the market committee. This also gave some of the previous volunteers some relief from their duties on the committee. Our lessons learned from the program as a whole are as follows: 1. We still struggle with how to get all of the mini grants to complete their entire project and use the entire grant funds. Since we don't know they haven't used all of the grant funds until after the program has ended redistributing the funds isn't an option. 2. While the open grant period is advertised and posted on our website many possible applicants don't learn of the grant until after the application period has past thus limiting the number of applicants being considered.
Contact Person:	**Contact: Sandy Hopple** **717-772-2693** **shopple@state.pa.us**
Project Title:	**Implementing Integrated Pest Management Control Strategies for Invasive Armored Scale Pests of Christmas Trees, Project 27**
Project Summary:	In Pennsylvania, there has been a need to develop and test alternative methods of controls for a serious pest problem for conifer trees: Cryptomeria scale (Aspidiotus cryptomeriae). This pest infests several species of conifer, namely firs, spruces and Douglas-firs, with the Fraser fir and Canaan fir being the two most common hosts in this area. These trees also happen to be some of the most popular conifers sold as cut Christmas trees and as landscape plantings. Christmas trees and landscape conifers are an important segment of Pennsylvania's green industry. According to a 2007 USDA/NASS survey, Pennsylvania ranked fourth in the nation for sales of Christmas and evergreen trees. As a pest which has a major effect not just on the health of the trees, but also the aesthetics of the trees, management of this pest is critical for an important and influential segment of Pennsylvania's growers. The conventional control method for this pest is the repeated applications of traditional, broad-spectrum insecticides. This practice has the potential to increase the development of scale resistance to insecticides. It also has a detrimental effect on the native beneficial insects which help to keep scale populations check. Growers have been looking for alternative control methods. Prior to this project, very little was being done in the state to provide research and education on these alternative control methods. For the past three years, this project has been responsible for providing some much needed research and education on the incorporation of biological controls and bio-rational insecticides. Integrated Pest Management refers to a management strategy that combines many facets of control so that pests are managed with the lowest cost to the environment, human health and grower expenses. Some of these facets include field sanitation, proper watering and nutrition for crops, mechanical barriers and trapping for pests, selection of pest-resistant species/varieties, enhancement and release of beneficial organism populations, and when necessary, using pesticides of the lowest toxicity. The practices of IPM can be very valuable for Pennsylvania farms. Although this can be a valuable tool, according to a 2009 USDA/NASS survey of the nursery and floriculture industry, only 3 percent of nursery growers surveyed are conducting deliberate

	scouting trips to production areas, only 38 percent are trapping insects for monitoring, only 12 percent of are releasing biocontrols, and only 22 percent are using biorational pesticides. Not only are growers not taking advantage of IPM, a national survey of conifer growers shows that the top three insecticides used are organophosphate and carbamate chemical products, all of which are broad-spectrum products and would be incompatible with most biocontrols. Incorporating IPM techniques could change this. By conducting a grant funded research project involving training growers in scouting, as well as the incorporation of introduced and native beneficial insects and compatible, 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. This is in fact proving to be true. The project team has now been working on this project for three seasons and has seen success with the process of teaching scouting techniques, monitoring growing degree days, utilizing soft pesticides, and incorporating biological controls. The use of traditional, broad-spectrum pesticides has been reduced, and the incorporation of beneficial insects and compatible soft pesticides are proving to be a safe and effective method of controlling pests in conifer nursery operations.
Project Approach:	In order for a new strategy in a farm operation to be accepted and adopted by farmers, the procedures should be practical and should give results that are an improvement over previous procedures. In that way, this project tried to make sure that we met the expectations of the cooperating growers. The project team came up with three achievable objectives that would be useful and practical: 1. Validate scale degree-day growth models through scouting and weather forecasting and develop a conifer scale warning system. 2. Educate growers through one-on-one training with an IPM specialist regarding scale (Cryptomeria and elongate hemlock) life cycles and other IPM techniques such as scouting, GDD accumulation, record keeping, introduction of natural enemies and conservation of natural enemies. 3. Survey for native natural enemies in plantations where pesticide use is reduced and replaced with soft pesticides that encourage the perpetuation of natural enemies. The objectives for this project were developed so that participating farms would be able to embrace IPM and incorporate it into the day to day operations of their farms. By successfully achieving this with the cooperating farms, the results could be shared with a greater audience of conifer nurseries and Christmas tree farms. Most growers would like to be able to exchange heavy use of conventional pesticides for a program that uses softer, biorational pesticides which allows a native insect predator complex to flourish. The knowledge of how to do this is the limiting factor for the majority of growers. This project worked to spread that knowledge. TEMPERATURE MONITORING: The first objective involves a key tenant of IPM. That is the use of temperature monitoring in the process of predicting certain events in insect development. By collecting daily temperatures to convert them into growing degree days (GDD - figures derived by comparison of average daily temperatures to a base minimum temperature at which point insect development progresses), growers can have an idea of when insect activity will begin and when they should be trapping and scouting. This was chosen as a project goal to drive home the importance of the practice. Each insect has a GDD range in which they will become active (i.e. hatch, lay eggs, pupate, emerge from overwintering sites, etc.) and for Cryptomeria scale, crawlers (or active nymphs) should emerge in a range of 600 – 800 GDD for the first generation and 1,750 – 2,130 GDD for the second generation. Throughout the course of the project, the team would test the accuracy of these ranges for scale populations in Central PA. Temperature recording was conducted concurrently with scale population monitoring. Project team members tracked temperatures in Lancaster and York Counties for the 2011, 2012 and 2013 growing seasons. [Results listed in Goals and Outcomes Achieved section.] EDUCATING IN IPM TECHNIQUES: The second objective of educating growers on pest life cycles and IPM techniques required that the project team find growers who had a desire to improve the health of their farms

and who would follow through and be fully involved in the project. During the three years of this project, project team members would have an initial meeting with growers to determine what the needs of their farm were, to discuss how IPM could improve the state of the farm and to develop an action plan for moving forward with the project.

In 2011, the project began with the growers from Springfield Tree farm in Loganville, PA and Stricklers Evergreens in Elizabethtown, PA. The owners of Springfield Tree Farm, Donna and Jeff Bortner became fully involved with the project by cooperating with the biocontrol experiment as well as the training in IPM Techniques. Stricklers Evergreens agreed to serve as a participant in conducting temperature monitoring and scouting at their farm. Both are small family farms with a variety of tree species and in turn a variety of pest issues, including Crypotmeria scale. Springfield farm had the added benefit of never having applied an insecticide or fungicide on their farm, so they had a considerable amount of beneficial insects on the farm before the project even began.

After meeting with Donna Bortner of Springfield farms in early spring of 2011, a plan was made to begin with scouting visits to the farm and to move forward with the release of a biocontrol organism for the control of Cryptomeria scale. Initially, the project would take place in two blocks of Fraser fir on one side of the farm (approximately 2000 trees). Project team member Sarah Pickel began holding educational scouting sessions (each lasted 2 or more hours) with grower Donna which focused on scouting techniques like proper hand lens use, locating pests and identification, and recognition of beneficial insects. These visits also provided an opportunity to determine how extensive the Cryptomeria scale infestation was in these two blocks. Infested trees were tagged with ribbon, which was very helpful when releasing the biocontrol in mid-summer.

Approximately 170 trees total were marked for having the presence of scale, or about 8.5%. [See figures 1 & 2 below.] There were 22 scouting training visits to Springfield Farm in 2011. [Twelve of those visits were made without the presence of the grower, because she suffered an injury that summer. It was necessary to continue the visits to conduct the biocontrol release.]

FIGURES 1 & 2: LEFT – Tagged Fraser fir trees have Cryptomeria scale present on their foliage; RIGHT – Grower Donna Bortner looks at Fraser fir twigs for Cryptomeria [Sarah Pickel, PDA]

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 season, 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 the project team worked with on this farm, consisting of about 1000 trees together. There were 18 scouting visits to Stricklers farm.

In 2013, a new participant was included in the project. Tim Strathmeyer of Strathmeyer Forests, Inc. wanted to change his company's dependence on old classes of broad-spectrum insecticides. Strathmeyer Forests, Inc. is a large nursery operation based in York County with multiple farms in throughout south central Pennsylvania. Tim contacted project team member Cathy Thomas in February of 2013 to discuss the possibilities of becoming involved in the project. Project members met with Tim in March of 2013 to discuss a plan for scouting Cryptomeria and elongate hemlock scale populations, and also spruce spider and Eriophyid mite populations. It was also decided that Strathmeyer would replace the majority of their scale control sprays with the reduced-risk, beneficial compatible insecticide Movento, as well as replacing the traditional miticides used with Envidor, a reduced-risk, selective miticide that is also compatible with beneficial insects. This season, there were 24 scouting visits to Strathmeyer farms in York County. Additionally, scouting visits continued to the other participants during the 2013 growing season, with 25 visits to Springfield Tree Farm and 28 visits to Stricklers Evergreens.

Throughout the three years of the project, scouting was also conducted at three other farms to compare the progression of Cryptomeria scale life stages and that of other common pests in York and Lancaster Counties. Visits were made to Miller's Christmas Trees and Nursery in Elizabethtown, to McCurdy's Tree and Landscaping Services in Dillsburg, and Gruver's Tree Farm in New Cumberland.

BIOLOGICAL CONTROL: Both Springfield tree farm and Stricklers Evergreens chose to participate in the biocontrol for control of Cryptomeria scale. After considerable research into potential biological control organisms in the spring of 2011, it was decided that the parasitoid wasp Aphytis melinus, a well know control of the Aspidiotus genus of scales, would be the best choice for this experiment. This was decided by the project team and the grower based on ease of release, known effectiveness of the control organism, commercial availability of the organism and pricing. Springfield farm (Farm A) participated in a release in 2011, 2012 and 2013. Stricklers Evergreens (Farm B) used the wasps in 2012 and 2013. At the time of Cryptomeria scale crawler emergence from under the adult scale covers, a series of three releases were made for both the first and second generations, following a recommendation from the IPM Program at University of California. The wasps were released at each marked tree on the farms by opening the scale containers (plastic cups of 10,000 wasps) for a few seconds to allow the wasps to fly out. [See Figures 3 & 4 for images of the wasp and their delivery method.]
Table 1 below lists the release dates and amounts throughout the seasons.

TABLE 1: Chart of *Aphytis melinus* releases in 2011, 2012 and 2013

Year	Release Date	Farm A Release Rate	Farm B Release Rate
2013	6/18/13	60,000	40,000
2013	6/25/13	60,000	40,000
2013	7/9/13	60,000	40,000
2013	8/13/13	60,000	40,000
2013	8/20/13	60,000	40,000

2013	8/27/13	60,000	40,000
2012	6/5/12	60,000	40,000
2012	6/12/12	60,000	40,000
2012	6/19/12	60,000	40,000
2012	8/14/12	60,000	40,000
2012	8/21/12	60,000	40,000
2012	8/28/12	60,000	40,000
2011	6/15/11	30,000	*Extra release in 2011 due to bad weather during 8/23 release. Also, Farm B didn't participate in Year 1.
2011	6/21/11	30,000	
2011	6/28/11	40,000	
2011	8/23/11	40,000	
2011	8/30/11	40,000	
2011	9/7/11*	50,000	

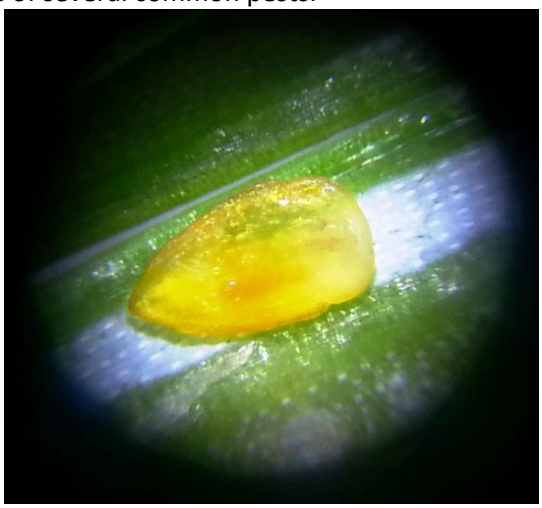
FIGURES 3 & 4: LEFT - Parasitic wasp *Aphytis melinus* among California red scale [Jack Kelly, University of California]; RIGHT - Wasp release at the base of a Fraser fir [Brian Schildt, PDA]

CONVERTING TO BIORATIONAL INSECTICIDES: Prior to the 2012 season, Springfield tree farm had not used any insecticide product on their Christmas trees. Because of the extent of the scale on their farm, it was decided by the project team that it would be beneficial for the farm to make two applications of the soft insecticide Movento (Bayer) while continuing to release the Aphytis melinus biocontrol. Although the parasitoids were infecting the scale and achieving a level of control, the parasitoids alone were not deterring the spread of the Cryptomeria scale. [See Tables 3 & 4 in the Goals and Outcomes Achieved section.] Movento is compatible with the parasitoid and predator insects found natively and introduced on the farm. Springfield used the product again in 2013, but the product was applied only once for the first generation. During the summer of 2013, the project team recommended that Stricklers farm also use Movento, this time at the start of the second generation, for the same reason that it was recommended at Springfield. Strickler made two applications of Movento. 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.

Additionally, in the 2013 season, new project member Tim Strathmeyer decided to exchange the chemical Dimethoate, a broad spectrum chemical toxic to beneficial insects for Movento. He used this product instead on several of his York county farms. Strathmeyer also incorporated the use of Envidor, a newer class of miticide

which is safer to beneficials.

ADDITIONAL EDUCATIONAL OPPORTUNITIES: Occasionally over the course of the three years, project team members met with the growers for the purpose of sharing more information than was covered in an in-field scouting session. Over the last three years, project members met 8 times with Donna Bortner of Springfield Tree Farm (or a farm volunteer in 2011) to discuss articles with issues such as weed control, handouts on insecticide control, biocontrol catalog options, compatible pesticide product options, and microscope sessions to observe life stages of Cryptomeria scale, Aphytis melinus, Chilocorus stigma and spruce spider mites. [See figures 5 & 6 below.] In 2012 and 2013, project team members met three times with Ollie Strickler to discuss the life cycle of Aphytis melinus, pesticide products were available for compatible use with a biocontrol program, and soil testing. Additionally, project members met with Tim Strathmeyer to discuss biorational pesticide products and life cycle of several common pests.

FIGURES 5 & 6: LEFT – Grower Donna Bortner looks at scale samples under the microscope; RIGHT – Cryptomeria scale parasitized with *Aphytis melinus* [Sarah Pickel, PDA]

Information was shared with a larger audience of tree growers in 2013. In the July, project team member Sarah Pickel spoke at the PA Christmas Tree Growers Association (PCTGA) annual summer meeting to share scouting techniques, life cycle information about major pests, including Cryptomeria scale and IPM control options including biocontrol with Aphytis melinus and the use of beneficial compatible products. Sarah has also agreed to speak at the 2014 PCTGA winter meeting on the topic of Cryptomeria scale control, where the results of this project will be shared.

Consumer education was also a part of the project. At the start of the 2011 Christmas retail season, project team member Sarah Pickel shared an educational poster display and spoke with customers at Springfield Tree Farm, as part of the annual York County holiday event, Christmas Time in Loganville, an event which draw consumers to Loganville businesses, churches and schools. While customers visited Springfield farm to partake in special retail sales of décor, trees and food items, they had the opportunity to learn about the IPM methods used at the farm, including the use of biocontrol. [See Additional Information section for figures 7 & 8.] The posters were displayed in the Springfield Farm retail area for the remainder of the 2011 season and were also used during the full 2012 Christmas season. The posters will be displayed during the 2013 season.

Goals and Outcomes Achieved:

TEMPERATURE RESULTS: Temperatures were collected for three seasons 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 2011, 2012 & 2013

Year	Scale Generation	Accepted Range	Lancaster GDD Total	York GDD Total	Date of Emergence
2013	1	600 – 800	812.0	781.0	6/13/13
2013	2	1,750 – 2,130	2612.5	2380.5	8/13/13
2012	1	600 – 800	790.0	846.0	5/29/12
2012	2	1,750 – 2,130	2595.5	2641.5	8/8/12
2011	1	600 – 800	852.5	830.5	6/8/11
2011	2	1,750 – 2,130	2572.5	2519.5	8/12/11

The trend has continued for the third year in a row that accepted GDD ranges for Cryptomeria scale generations (600 - 800 GDD for the first generation and 1,750 – 2,130 GDD for the second generation) do not appear to be broad enough. Only two figures throughout the project were actually within the range. Previous seasons both had a rapid rise in early spring temperatures which may have been a reason behind the figures being skewed, however, in 2013 that was not the case. Growing degree days were slower to accumulate at the start of the 2013 season, but the range still was off. 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. As a result of these GDD findings, there would be cause to broaden the upper end of these ranges when reporting these figures in the PA Christmas Tree Scouting Report for the 2014 season.

SCALE OBSERVATIONS: For the last three growing seasons during which the parasites have been released, samples were taken from tagged trees where the wasps were released, as a means of monitoring the level of parasitism in the test blocks. A number of twigs were sampled each time and the scales were assessed and counted under dissection microscopes. The scales were either labeled as Dead, Live or Parasitized. For Farm A, there have now been 3 seasons of observations, and for Farm B there have been 2 seasons of observation. The results from these counts are listed in the chart below.

TABLE 3: Scale count figures for 2011, 2012 & 2013

FARM A						FARM B					
Year	Collection Date	Scale Counts			% Parasitized	Year	Collection Date	Scale Counts			% Parasitized
		Dead	Live	Parasitized				Dead	Live	Parasitized	
2013	7/16/2013	131	136	428	61.58	2013	7/7/2013	50	67	151	56.34
2013	7/30/2013	114	79	315	62.01	2013	9/4/2013	97	10	21	16.41
2013	8/6/2013	119	207	460	58.52	2013	9/10/2013	49	3	42	44.68
2013	9/5/2013	64	85	345	69.84	2013	9/19/2013	95	8	13	11.21
2013	9/17/2013	101	35	258	65.48	2013	**Average % of Parasitism**				**32.16**
2013	9/24/2013	44	189	484	67.5	2012	7/12/2012	16	191	129	38.39
2013	**Average % of Parasitism**				**64.16**	2012	7/27/2012	2	63	124	65.61
2012	7/10/2012	267	92	541	60.11	2012	8/23/2012	39	10	21	30

2012	7/24/2012	163	70	147	38.68	2012	9/14/2012	0	31	18	36.73
2012	8/7/2012	58	196	91	26.38	2012	**Average % of Parasitism**				**42.68**
2012	9/11/2012	139	181	42	11.6						
2012	9/24/2012	113	298	76	15.61						
2012	10/9/2012	70	333	84	17.25						
2012	**Average % of Parasitism**				**28.27**						
2011	6/21/2011	445	128	896	60.99						
2011	6/28/2011	405	73	414	46.41						
2011	7/5/2011	570	654	375	23.45						
2011	7/15/2011	795	70	1222	58.55						
2011	7/21/2011	375	63	1039	70.35						
2011	8/16/2011	165	97	97	27.02						
2011	8/23/2011	245	293	170	24.01						
2011	8/30/2011	63	76	235	62.83						
2011	**Average % of Parasitism**				**46.7**						

TABLE 4: Summary of the parasitism percentages at the two farms for 2011, 2012 & 2013

Year	Farm	% Parasitism
2013	A	64.16
2013	B	32.16
2012	A	28.27
2012	B	42.6
2011	A	46.7
2011	B	N/A

As the summary of parasitism percentages shows, there continues to be a level of parasitism, and for Farm A that level showed a large increase in 2013. The slightly troubling fact from the previous two years continues that while the percentage is good, the percentages are not high enough for what a commercial grower would like to see. These growers depend on a product that looks beautiful, and to their description that would be a tree with the smallest amount of damage to the foliage. Any grower would say that they look for a control level as close as possible to 100%.

The project team feels that the figures for Farm A are encouraging. For the 2013 season, there was a definite improvement in the level of parasitism. This farm had used the product Movento for the second year in a row with the first generation. While in 2012, the product was applied twice, the product was only applied once in 2013. In 2012, there was a reduction of parasitism, but for the 2013 season, we saw the best level of parasitism thus far. It is still unclear if the parasitism level was improved because the parasites are finally taking off after the third season, or if this level was negatively impacted by 2 applications of Movento in the previous season, but reached the right level of scale control with the one application. Although it's difficult to definitively say the

Movento applications are the variable factor, the project team feels that a similar adjustment for Farm B would possibly improve that farm's level of parasitism. Our recommendation to Farm B will be to make a single application of Movento at the beginning of the first generation and to continue with the recommended Aphytis releases. Looking at scale levels for another season would allow the project team to confirm that this pattern would

INCREASE IN IPM MANAGED AREAS: One clear goal for this project was that there would be an increased amount of acreage under management practices that include IPM. On Springfield Tree Farm and Stricklers Evergreens, the farms continue to use scouting and management practices of IPM. On Springfield Farm, the area scouted has expanded from approximately 6 acres to 10 acres. With the addition of a new cooperator, Strathmeyer Forests, Inc. there has been another increase in acreage for the project. There are two locations regularly scouted in which a total of approximately 6 acres is scouted. The hope is that as the participants see the benefits gained by incorporating IPM techniques, the total acreage managed with IPM will continue to expand.

PESTICIDE USE: In the 2013 season, the project saw a continued incorporation of reduced-risk, biocontrol compatible insecticide products. For Springfield Tree Farm, the usage of Movento was cut in half because the grower went from making two applications of the product for the first generation of Cryptomeria scale to a single application. This grower did add a spray for spruce spider mites, but the product used was an ultra-refined oil product known as Suffoil (Bioworks). The project team recommended the use of this product because the oil is a very soft insecticide which is compatible with a biocontrol program. For Stricklers Evergreens, 2013 saw an increase of pesticides for the farm with two applications of Movento for the second generation of Cryptomeria scale. Although Strickler did not have to make an application to these trees during the 2012 season, the project team feels that use of the reduced-risk, biocontrol compatible Movento was a wise choice for the farm. In the 2014 season, the project team hopes that Stricklers will be able to reduce this amount to a single application. For Strathmeyer Forests, there was an increase in the use of softer, biocontrol compatible products. The product Envidor was incorporated for the control of Eriophyid mites in one of the project fields. In the other project field, the use of the broad-spectrum conventional pesticide Dimethoate (2 applications) was replaced with Movento (1 application). Overall, seeing a reduction in traditional pesticides and an increase in the use of biocontrol-compatible pesticides meets the projects goals for pesticide usage.

NATIVE BENEFICIALS: Throughout the three years of the project, team members observed a wide array of beneficial insects on all the participating farms while monitoring the Cryptomeria scale populations. The 2013 season saw an obvious increase in the amount of insects found on the Strickler farm. The population of twice-stabbed lady beetles, praying mantids and spiders grew from the 2012 season to 2013, after just one season without any insecticide application. Even after the Movento applications in the 2nd generation, project team members continued to find lady beetles, mantids and spiders. For Strathmeyer Forests, the amount of scale predators was clearly increased and made an obvious improvement in the scale population. Observing samples with a hand lens showed that lady beetle predators had eaten a considerable amount of the scale population. Evidence of parasitoid wasps was also clear. Exit holes made by native parasitoid wasps were visible in a considerable percentage of the scale covers. For Springfield Tree farm, lady beetles (both twice-stabbed and multi-colored Asian) and native parasitoid wasps continued to be found in the 2013 season, but 2013 saw an increase in the level of spiders and praying mantid egg cases. In three years of the project, the use of Movento (and also Suffoil and Envidor) allowed these beneficial insects to flourish. The project team feels these native beneficials are an important supplement to the biocontrol releases made each summer on these farms.

EDUCATIONAL OUTREACH: On one participating farm, information about this project was shared with the consumers visiting the farm during the Christmas retail season. Springfield Tree Farm sets up a retail shop in

	the barn on their farm, which provides visitors the opportunity to purchase some hot chocolate and browse the retail items. Among the retail displays, the Bortners proudly displayed the poster series which explains some of the IPM innovations happening at Springfield farm. Throughout the 2011 and 2012 Christmas retail seasons, Donna Bortner estimates that between 1200 and 1300 consumers visited the retail store at the farm. These visitors all had the opportunity to observe the educational posters and potentially were introduced to the concepts of IPM and biological control. The posters will also be used in the 2013 Christmas retail season allowing even more consumers to be exposed to IPM.
Beneficiaries:	The beneficiaries directly affected by this project are Springfield Tree Farm, Stricklers Evergreens, and Strathmeyer Forests, Inc. as well as their customers. These growers have expressed their satisfaction with the results of the project as well as the opportunity to learn the scouting techniques. The results that have been gathered from the three years of this project on both the incorporation of biocontrol organisms and of the use of the reduced risk insecticide Movento have been shared with larger groups of Christmas tree growers. In the summer of 2013, team member Sarah Pickel spoke to at the PA Christmas Tree Growers Association (PCTGA) annual meeting about scouting and control methods for Cryptomeria and elongate hemlock scale, where both the use of *Aphytis melinus* and Movento biorational insecticide were explained and recommended. There were 150 growers and farm employees in attendance at this meeting, and all attendees were able to attend one of the two sessions during which Sarah's IPM talk was offered. Sarah has already been scheduled to speak at the PCTGA annual winter meeting in January 2014 on the topic of Cryptomeria Scale. Attendance at this meeting is regularly over 150 growers and farm employees. This will provide opportunity to promote the use of the techniques used in this project. Temperature information gathered through this project has been shared through the 2013 PA Christmas Tree Scouting Report. This report, which is authored by project team member Sarah Pickel, 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
Lessons Learned:	First, these three seasons have shown that the long accepted GDD range for the Cryptomeria scale generations are perhaps not broad enough for the scale populations in central Pennsylvania. A broader range can be shared with a larger group of growers through the Pennsylvania Christmas Tree Scouting Report. This change would benefit growers by providing a longer window during which they could be scouting for Crypotmeria scale. Looking back at the farms that the project team has worked with over the previous three seasons of this project, it seems that the growers have truly embraced the concepts of IPM. They have learned to value the information that can be gained through scouting and they have showed that they care about the types of products that are used on their farms. They also exhibit a sense of pride about being innovators in the area of biocontrol for conifer plantations. This leads us to believe that growers may be willing to try this technique for other major Christmas tree pests. Although the success level of parasitism is still not what the project team ultimately hoped for at the end of the third season, we have begun to see a change in course of the project at Springfield farm. The results from the scale counts are beginning to show that the best results for a biocontrol program can be gained by combining the wasp releases with an application of the soft pesticide Movento. Further seasons with this technique will help to confirm this finding.
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	caththomas@state.pa.us
Additional Information:	**FIGURES 7 & 8: Informational IPM Posters used by participating grower to educate consumers. [Sarah Pickel, PDA]**

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

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.

<u>Note</u>: This wasp is microscopic and completely harmless to Humans!

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

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 <u>ww.paipm.org</u>.

Project Title:	**Bureau of Market Development, Project 31**
Project Summary:	Provide cost sharing support for successfully completed USDA Good Agricultural Practices (GAP) or USDA Good Handling Practices (GHP) audit annually. The program provides a maximum reimbursement of $400 towards one successfully completed audit per year. The reimbursement is used as an inducement for farmers who are considering participation in the voluntary audit process. Given the increasing requirements of retailers, these audits are a way for our producers to be more competitive when marketing their product. Consumers have become increasingly concerned with the nutritional benefits of their foods, as well as food safety. The continuation of a GAP and GHP cost share program will encourage participation and provide economic relief for incurred costs. With an increased concern of food safety and food borne outbreaks, regional and national grocery stores may need to implement and document on the farm food safety practices. Since the first instance that this project has received funding, the program has continually grown on an annual basis in terms of number of participants.
Project Approach:	The program is administered by the Pennsylvania Department of Agriculture 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. This is the third time this project has received grant funding. At the time the first grant was written, less than 20 producers in Pennsylvania were participating in the voluntary GAP/GHP audit program. In the first 12-24-B-0946 grant, there were 40 participants in the first year of the program and 81 participants in year two. An advisory group, 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. At the outset of the project, all the necessary documents and web links on the state web site were updated. After all information had been updated, the documents were forwarded to the Bureau of Food Safety, Penn State Extension Educators and other involved stakeholders, in order to distribute to possible applicants. In an effort to increase the number of applicants, staff attended educational workshops to promote and explain the programs. Once applications were submitted, they were checked for completeness and processed. Reports were then produced by staff, allowing to better communicate the progress of the program. It was realized that monthly reports allow better tracking by staff, as well as allow staff to better provide applicants with updates. This grant (12-25-B-1251) provided cost share funds to 108 applicants for a total of $42,509. This result was expected based on changes made during the grant year and overall trends in USDA GAP and GHP audits. First, we had some overlap with the previous grant funding applications for the 2011 and 2012 growing seasons? Second, the increase in retailers requiring the use of 3rd party audits which the grant do not reimburse has an effect on our overall numbers. With that in mind, we shifted $20,000 out of the grant to another project (can reference the amendment) and shifted a portion of the remaining $50,000 to indirect and administrative costs totaling $7,491. The remaining balance of $7,491 was used towards administrative and indirect costs.
Goals and Outcomes Achieved:	At the outset of the grant, a total of $70,000 was budgeted in anticipation of 175 applications. 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. During the grant, $20,000 was shifted to another project under the Specialty Crops Block Grant reducing our overall grant amount to $50,000 which could have completed a maximum of 125 at $400/application during the

	period. That revised goal was nearly realized, due largely to the term extension, with actual numbers of 108 applicants for a total of $42,509 provided in cost share. Remaining funds were allocated for administrative and indirect costs.
Beneficiaries:	This grant (12-25-B-1251) provided cost share funds to 108 applicants for a total of $42,509. The operations were all specialty crops operations either participating in the Good Agricultural Practices, Mushroom Good Agricultural Practices or Good Handling Practices USDA audits.
Lessons Learned:	While the overall rate of growth in participation in the program as it relates overall to GAP/GHP cost share activity appears to be reaching a plateau, there are lessons learned and possible new approaches that can increase participation in the program in the future. First, 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. 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. Second, continued and increased outreach is essential to increasing participation in this program and our field staff is our first line of information because they are out on the operations. Providing increased training in the program to field staff will allow us to reach producers on an individual basis. Lastly, the use of web and print publications as well as targeted mailings can all be used to greater effect in the future.
Contact Person:	Kyle B. Heffner 717-836-3973 kyheffner@pa.gov
Additional Information:	http://10.41.0.36/AgWebsite/ProgramDetail.aspx?name=GAPGHP-Program-&navid=12&parentnavid=0&palid=89&
Project Title:	P

Project Summary:	Established in January of 2003, the PA Preferred Culinary Connection ranks among the most visited attractions of the Pennsylvania Farm Show. Over the course of eight days, the PA Preferred Culinary Connection hosts nearly 50 cooking demonstrations, with a focus on providing nutrition knowledge and showcasing the importance in consumption of Pennsylvania- sourced products and particularly specialty crops. Chefs from throughout Pennsylvania, TV Celebrity Chefs, and Culinary Schools educate the audience on the advantages of consuming specialty crops by incorporating such products into their recipes. Representatives from organizations such as the Pennsylvania Vegetable Growers, PA Apple Growers, PA Mushroom Institute, PA Winery Association, PA Beekeepers Organization and PA Maple Syrup Producers directly participate in the stage demonstrations and hand out literature on local producers and the advantages of buying from Pennsylvania sources. Certain days are designated by a specific specialty crop, which becomes the main ingredient to be incorporated in all dishes prepared on our stage that day (For example, Mushroom Day, Vegetable Day, Apple Day, etc.) Samples of each dish are prepared for audience members to taste in the conclusion of each demonstration. In addition, the PA Preferred Culinary Connection focuses on educating children and adults on healthy eating habits and food safety by demonstrating step-by-step food preparation while utilizing locally grown specialty crops. The importance of this project constitutes in the idea that it allows local farmers and food suppliers to showcase their specialty crops to local consumers; to educate the patrons on the health benefit to their families as well as the impact on their community's local economy by highlighting the quality and accessibility of those products; to reach out to the restaurant community and encourage Chefs to use Pennsylvania-sourced fruits, vegetables and herbs in their establishments; and to increase the overall demand for locally grown, sustainably produced specialty crops. By creating spectacular dishes on stage using local specialty crops, our demonstrating Chefs have educated consumers that they can prepare delicious meals at home by utilizing solely Pennsylvania fruits, vegetables and herbs The SCBGP funds have allowed the PA Preferred Culinary Connection to focus primarily on promoting specialty crops. In the past, the program has been primarily made possible as a result of contributions from various organizations, such as Giant Foods (providing all food ingredients), Thermador (providing all equipment) among others and mainly the PA Department of Agriculture (providing the facility). The SCBGP funds supplement the above listed contributions and allowed the PA Preferred Culinary Connection to focus specifically on promoting PA Specialty Crops.
Project Approach:	The organization and management of the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops have largely followed the proven model while incorporating some additional elements, which we believe have further benefited the Pennsylvania Department of Agriculture in its effort to enhance the competitiveness of Pennsylvania's specialty crops. Our efforts have focused on fulfilling the purpose of the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops – to showcase and promote the use of Pennsylvania-sourced products and particularly specialty crops in preparing original dishes, increase consumer awareness of those locally grown products and highlight the quality and accessibility of specialty crops - while incorporating entertainment, flair and star talent in delivering this message. We at Strategic Contracting rely on years of experience, established relationships with local Chefs, Culinary Schools, Specialty Crops groups, Media personalities and TV Star Chefs, as well as a thorough understanding of the program and all the necessary elements to achieve the greatest impact in the execution of this project. We invited Chefs from high end and well known restaurants in Pennsylvania to conduct cooking demonstrations, educate and spread awareness aimed at increasing local consumption of Pennsylvania's specialty crops in the community. Once again, we included the Chef Instructors and Students from the top Culinary Schools in Pennsylvania, who supported the stage presentations for our demonstrators, showcased their talent and shared information on food safety and preparation.

	Representatives from organizations such as the Pennsylvania Vegetable Growers, PA Apple Growers, PA Mushroom Institute, PA Winery Association, PA Beekeepers Organization and PA Maple Syrup Producers directly participated in the stage demonstrations and handed out product samples and literature to the patrons. Their products were offered for purchase in close proximity to the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops stage in the Main Expo Hall. According to Pennsylvania Ag News: • "Pennsylvania Maple Syrup Producers sold more than 5,000 bags of maple cotton candy and 550 gallons of maple syrup;" • "Pennsylvania Beekeepers Association sold more than 750 gallons of honey ice cream and 6,800 pounds of honey between their booths in the Food Court and Main Hall, and used 670 pounds of waffle mix;" • "Pennsylvania Mushroom Grower's Cooperative sold more than 7,000 pounds of mushrooms;" • " Pennsylvania Vegetable Growers sold 11,000 Strawberry Surprise drinks, 6,600 pounds of onions, 3,400 salads, 600 veggie wraps, 8,400 bowls of soup and 2,000 pickles;" PA Mushrooms were featured on opening Saturday, Mushroom Day at the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops, and served as the main ingredient in the dishes that this year's Celebrity Chef Mike Isabella prepared on stage. Chef Isabella, Bravo's Top Chef All-Stars Runner Up, kicked off the 2012 PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops, entertained the audience and took pictures with the many fans in attendance. Avid supporter of buying local and incorporating specialty crops into his restaurants' menus, Chef Isabella demonstrated how to prepare two of his signature mushroom-inspired dishes, which everyone in the audience had an opportunity to taste. Creating the most appealing PA Preferred dish, utilizing Pennsylvania-sourced specialty crops was also the theme of The PA Preferred Battle of "The Burg" Cook Off. Local TV and radio hosts teamed up with some of the most well-known restaurant Chefs from the area and were tasked with preparing the most creative PA Preferred dishes that showcase the freshness, quality and diversity of Pennsylvania-sourced specialty crops. They also paired their creations with wines from local vineyards. We had the honor to welcome a very special guest to this year's PA Preferred Culinary Connection stage – The First Lady of Pennsylvania, Mrs. Susan Corbett. On Sunday, Vegetable Day, she prepared the family's favorite corn pudding recipe in front of a large audience while she was assisted by Tim Harris, ACF Chef and Wes Trout, a Culinary Trainer for BOSCH and Thermador Appliances. Mrs. Christine Greig, wife of Secretary of Agriculture George Greig, also appeared on the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops stage and prepared her famous apple crisp especially for Apple Day. She was later joined by Secretary Greig for some pictures in front of our beautiful apple display.
Goals and Outcomes Achieved:	The goal of this project has been to continue and expand the efforts to date in attracting the participation of Pennsylvania Chefs, Culinary Schools, TV Celebrity Chefs, as well as the local Media in promoting locally sourced products and in particular the competitiveness of Pennsylvania's specialty crops. The project, facilitated through Strategic Contracting, has allowed this important message to reach many consumers and provide them with information on specialty crops suppliers and the advantages of buying local. The 96th Pennsylvania Farm Show, one of the most celebrated agricultural events in the country, attracted record crowds in 2012 - more than 400,000 people. Nearly 70,000 vehicles were parked at the Farm Show lots throughout the week, compared to 55,000 parked last year – a 22 percent increase. There was no better place to celebrate this year's theme "From Farm Gate to Dinner Plate" than the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops, where approximately 8,000 people gathered throughout the week to watch an all-star lineup of chefs, local celebrities and Specialty Crops producers entertain, prepare and create dishes using Pennsylvania-sourced specialty crops. The Patriot News described the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops stage as "the main gathering spot…in the complex's Main Hall", "a returning favorite" and "one of the most popular parts of the Pennsylvania Farm Show." The PA Farm Show: Facts & Figures listed in 2012 that "Two of the most popular attractions at the PA Farm Show are the PA Preferred Culinary Connection and the PA Marketplace." The PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops attracts a wide range of cooks, home makers

	and food enthusiasts. In fact, many audience members plan their trip to the Farm Show around the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops now, where they not only get ideas about creative dishes they can prepare at home using specialty crops but even learn what kind of wine compliments each dish. The 2012 PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops received increased media coverage and had more website visits than ever before. Social media played a major role this year in communicating the importance of using specialty crops via twitter, facebook and numerous blogs online. ABC 27 was one of the many TV stations that covered this year's PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops and aired footage directly from the stage. WHP CBS 21, PCN, Penn State Radio, Bob 94.9, and the US Farm Report among other media outlets conducted interviews and put the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops in the spotlight, spreading the word of the importance of buying local specialty crops to thousands of viewers and listeners. The Patriot-News, the area's major daily newspaper, which reaches nearly 500,000 readers weekly in print and on pennlive.com, included almost every day coverage of the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops and reminded its readers to visit our stage for some exciting programming and a taste of Pennsylvania. In addition, the PA Preferred Culinary Connection with focus on promoting Pennsylvania Specialty Crops was also promoted in The Sentinel, The Herald Standard, Valleynewslive.com, Bradford Today, whptv.com, News25.com, abc27whtm.cpm, fox54.com, pct.edu, The Pennsylvania Market Maker, altoonamirror.com, readingeagle.com, exploreclarion.com, pennsylvaniaagconnection.com, cumberlink.com, pennlive.com, cenytredaily.com, noodls.com, gantdaily.com, northcentralpa.com, newsblaze.com, gantdaily.com, ldnews.com, fultoncountynews.com, farmanddairy.com, vacationplanning.net, tastydays.com, americantowns.com and entertainmentgossipblog.com. Such extensive media coverage spreads the message of buying local specialty crops to millions of readers and influences their preferences when they dine or shop.
Beneficiaries:	The Pennsylvania Vegetable Growers, PA Apple Growers, PA Mushroom Institute, PA Winery Association, PA Beekeepers Organization and PA Maple Syrup Producers are some Commodity Groups that benefited directly from the successful execution of this project. They were able to not only showcase and sell their products to a wide range of consumers but also educate them on the benefits of using specialty crops as part of their daily menu. Representatives from organizations such as the Pennsylvania Vegetable Growers, PA Apple Growers, PA Mushroom Institute, PA Winery Association, PA Beekeepers Organization and PA Maple Syrup Producers directly participated in the stage demonstrations and handed out product samples and literature to the patrons. Their products were offered for purchase in close proximity to the PA Preferred Culinary Connection stage in the Main Expo Hall. According to Pennsylvania Ag News: •"Pennsylvania Maple Syrup Producers sold more than 5,000 bags of maple cotton candy and 550 gallons of maple syrup;" •"Pennsylvania Beekeepers Association sold more than 750 gallons of honey ice cream and 6,800 pounds of honey between their booths in the Food Court and Main Hall, and used 670 pounds of waffle mix;" •"Pennsylvania Mushroom Grower's Cooperative sold more than 7,000 pounds of mushrooms;" •" Pennsylvania Vegetable Growers sold 11,000 Strawberry Surprise drinks, 6,600 pounds of onions, 3,400 salads, 600 veggie wraps, 8,400 bowls of soup and 2,000 pickles;" The PA Preferred Culinary Connection with focus on Specialty Crops has been reported to be one of the main events as part of the PA Farm Show. Each year the Pennsylvania Farm Show brings in approximately $90 million in economic impact to the Harrisburg region.
Lessons Learned:	The 2012 PA Preferred Culinary Connection with focus on Specialty Crops project has given us new ideas and targets to reach. We are determined to build on our success and reach many new consumers, bring in additional partners and commodity organizations. Utilizing the social media more effectively will allow us to spread our

	message of the importance of specialty crops even better and to a wider demographic.
Contact Person:	Maria Hulitt (267) 269-8894 maria@strategiccontracting.com
Additional Information:	For event photos, Chefs' bios and recipes, visit http://www.papreferred.com/culinary_connection

Chef Mike Isabella, from Bravo's Top Chef All Stars, demonstrating how to create delicious meals using fresh, Pennsylvania mushrooms.

Local TV and radio hosts teamed up with some of the most well known restaurant Chefs from the area and competed to create the most appealing PA Preferred dish during the PA Preferred Battle of "The Burg" Cook Off.

We had the honor to welcome a very special guest to this year's PA Preferred Culinary Connection stage – The First Lady of Pennsylvania, Mrs. Susan Corbett. On Sunday, Vegetable Day, she prepared the family's favorite corn pudding recipe in front of a large audience while she was assisted by Tim Harris, ACF Chef and Wes Trout, a Culinary Trainer for BOSCH and Thermador Appliances.

Students from the Pennsylvania College of Technology faced off in a 30-min cooking challenge and impressed the judges from CBC by preparing spectacular dishes using PA-sourced ingredients.

A huge crowd gathered to watch Kathy Wickert, Chef at the Camp Hill Giant Super Food Store, prepare her signature baked potato soup. She gave an interview earlier that morning for WHP CBS 21 and encouraged viewers to buy local.

Representatives from the PA Maple Syrup Producers took the PA Preferred Culinary Connection Stage almost every day of the event. There, visitors were able to see the process of tapping the maple tree, collecting sap and boiling it down to make delicious syrup. Free samples were available for the audience to taste at the conclusion of each demo.

Chef Instructor Brian Peffley and Students from the Lebanon County Career & Technology Center

Allen Friend, Executive Chef, Woods Creek Grill, Jonestown, PA

The Students from the Lebanon County Career & Technology Center wow-ed the judges from Capital BlueCross during the PA Preferred School Cooking Challenge by creating appealing apples-inspired dishes

The spectacular apple display adjacent to the stage

A presentation by representatives from the Pennsylvania Beekeepers Association

Frank Jurbala from the Pennsylvania Department of Agriculture

Chef Tim Harris from Harrisburg's ACF Chapter

Maple syrup production demonstration by the Pennsylvania Maple Syrup Producers

Honey extraction demonstration by representatives from the Pennsylvania Beekeepers Association

Project Title:	Direct Farm Sales Program PHASE II, Project 33

Project Approach:	During the open application period as applications are received they are reviewed to ensure that the project has the ability to increase the consumption of specialty crops. Projects not increasing the consumption of specialty crops are immediately rejected and not reviewed by the board. The project board evaluates each application individually to determine how many people the project will benefit from the grant, if the project will help meet the Direct Farm Sales programs goals and outcomes. Once projects have been selected for funding all budgeted line items are reviewed to ensure that each line item is allowable and will result in the increased consumption 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. Receipts from mini grants are reviewed to ensure that non specialty crops expenses were not reimbursed with specialty crops block grant funds. Mini grants provide copies of advertisements placed, recipe cards, which are reviewed to determine if it solely enhanced the competitiveness of specialty crop items. In some cases, non specialty crop items have indirectly benefited from completion of some of the projects. Cooking classes, recipes and advertisements feature specialty crop items in them may benefit a specific market location because that is where the recipient received the information, but it doesn't mean that they won't take the information received and purchase specialty crop items at other markets and retail stores. For example, a recipe card for Easy cheesy zucchini says that it's from the Wolff's Apple House kitchen, but it doesn't say you to use only zucchini purchased from Wolff's Apple House it simply says zucchini. 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. Summaries from some of the mini projects goals and outcomes are shown below.
Goals and Outcomes Achieved:	not reached. The WIC FMNP redemption did increase by a percent. Since the trend in the past 10 years has been either to stay the same or decrease an increase of a percentage is a big achievement. Many of the projects funded did increase the redemption at their market over the previous year. 4,302 FMNP checks were redeemed at locations where Phase 2 mini grant projects were conducted. We did not achieve our goal of having 100 applications for the mini grants for this grant period. There were only 18 applications this year with 12 mini projects being awarded funding this year. This being a second round of accepting grants for this type of project in a year attributed to the low number of applications received. Applications receiving grant funds in the first round were not permitted to apply for additional funds. 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 if the number of PA Preferred specialty crop vendors increased. At the end of 2013 there were 629 specialty crops vendors enrolled in the PA Preferred program. 61 PA Preferred vendors were directly affected by the Phase 2 mini grants. Some project outcomes are as follows: Total program goals

	Goal 1: To increase the number of outlets in underserved areas Target: Add 5 new markets in underserved areas Benchmark: In 2012 there were 1,086 farmers markets and farm stands Performance Measure: At the end of 2013 there were 1015 *Note it is possible that there are additional market locations that have not been reported to us. Goal 2: Creating awareness of Pennsylvania farm stand and farmers' market outlets Target: We did not include a target for this in our proposal Benchmark: in 2011 market sales of specialty crops was 1,493.3 million pounds Performance measure: We have not been able to locate a source for this information. We will work on finding a new benchmark to measure this goal in the future. Goal 3: Increase child and adult nutrition knowledge and consumption of specialty crops Target: We did not include a target for this goal in our project proposal. A target would be 5 Benchmark: Without the Direct Farm Sales there are not any markets offering nutrition education to children and adults Performance Measure: The mini grants provided some form of nutrition education at 5- different markets. This included printed information and cooking demonstrations utilizing specialty crops Goal 4: Increase the FMNP redemption rate for Pennsylvania produce Target: Increase the FMNP checks redeemed from 75% to 80% Benchmark: The FMNP check redemption in 2012 was 70% Performance Measure: The FMNP check redemption in 2013 at this time is 87% for seniors and 53% for WIC for an overall program redemption of 70%. The WIC redemption is an increase of 1% while the senior redemption remained the same as it was in 2012. Goal 5: Increase the number of PA Preferred specialty crops producers participating in the program Target: In our proposed project we did not include a target this year. Benchmark: PA Preferred specialty crop vendors in 2012 65. Performance Measure: The number of registered PA Preferred vendors at the end of 2013 was 629. **Note**: These are only those that sell specialty crops that were counted.
Beneficiaries:	Over 35,453 people benefited from Phases 2 Direct Farm mini grant projects. This number doesn't include the number of farmers and other vendors that benefited 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 Phases 2 were 61. There were approximately 4,302 FMNP checks received by farmers benefiting from Direct Farm Sales Grant projects. It is unknown how many other businesses benefitted from information obtained from these mini grants. For example a recipe card could have been used many times with the person purchasing from other farmers markets, farm stands or even the grocery stores.
Lessons Learned:	Our lessons learned from the program as a whole are as follows:

	1. Although we only had a few project that didn't use all of their allocated grant , we still struggle with how to get all of the mini grants to complete their entire project and use the entire grant funds. Since we don't know they haven't used all of the grant funds until after the program has ended redistributing the funds isn't an option. 2. While the open grant period is advertised and posted on our website many possible applicants don't learn of the grant until after the application period has past thus limiting the number of applicants being considered. List of mini grant recipients Just Harvest $5,000 Penn State $4,500 **Note this project was not complete. No SCBG funds were used. Saucon Valley Farmers Market $4,000 Columbia Historic Market $3,500 Greensgrow Philadelphia Project $3,000 Adams County Farmers Market Association $3,000 Peoples Emergency Center $2,500 Whistle Pig Pumpkin Patch $2,000 Berks Ag Resource Network $2,000 Borough of Bath $1,500 Somerset Farmers Market $1,500 Broyans Farm Produce $1,500
Contact Person:	**Contact: Sandy Hopple** **717-772-2693** **shopple@state.pa.us**