New Jersey Department of Agriculture

Specialty Crop Block Grant Program (SCBG)
SCBG Agreement # 12-25-B-1476

Final Performance Report

Submitted; January 15, 2016
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Submitted by; Logan Brown
Economic Development Representative
New Jersey Department of Agriculture
Health and Agriculture Building, 3rd Floor
369 S. Warren & Market Streets
P.O. Box 330
Trenton, NJ 08625
TEL; 609 292-8856
FAX; 609 341-3212
E-mail: logan.brown@ag.state.nj.us

American Cranberry Growers Association
Specialty Crop Block Grant # 12-25-B-1476
Final Performance Report
June 15, 2016 - Revised

PROJECT TITLE

"Utilizing infrared Thermal Imaging in Cranberries to Study Heat Stress, Optimize Irrigation and Monitor Plant Health"

PROJECT SUMMARY

Provide a background for the initial purpose of the project, which includes the specific issue, problem, or need that was addressed by this project.

Background: Cranberries are a high value specialty crop in the Northeast region. Massachusetts and New Jersey are the two largest Northeast producing areas. Maine has a nascent industry that may see expansion in the future, and small plantings exist in Delaware, Rhode Island, New Hampshire, Connecticut and New York. Other states where cranberries are grown include Wisconsin, Oregon, Washington and Michigan. Cranberries can yield over 50,000 pounds/acre however state averages are generally below half of that. Cranberry prices have fluctuated significantly over the past ten years ($0.10-$0.90/lb) and they are currently about $0.45/lb with an average gross value of $15,500/acre. In 2011, the value of utilized production for New Jersey was $32,100,000.

Cranberries are a water intensive crop adapted to a cooler temperate climate. For maximum productivity cranberry beds require water for flooding (harvest and protection from winter freezing), and irrigation for protection from heat and frost as well as for feeding the water requirements of the crop. There has been significant research conducted on the effects of high temperatures on cranberry growth however, it has been very difficult to put this research into management practice. One of the main problems has been the lack of a method for accurate measurement of canopy temperature. Due the small size of the cranberry leaf, temperature probes have been unsuccessful.

The primary use of funding for this project was to purchase a high quality thermal camera that could be used to quantify and describe the distribution temperature variation in the cranberry canopy. Funding for research projects aimed at testing the temperature variation were funded separately from the NJ cranberry research council.

Describe the importance and timeliness of the project.

In response to increasing price fluctuations cranberry growers must develop more efficient methods for production to remain economically viable. One approach to this problem is to optimize yields within the production system. In New Jersey, growers have funded several research projects aimed at elucidating limiting yield components and have worked extremely hard to optimize production on limited acreage. Recently, reduced photosynthesis which occurs during the hottest part of the day during growing season has been shown to affect yield. This mid-day depression was considered manageable through irrigation however the measurement of photosynthesis in response to irrigation and translation to yield has been problematic.

The over-riding objective in this grant was to develop criteria where only the minimum in irrigation cooling to relieve heat stress. An improved understanding of the effect of canopy temperature on midday depression and scald will lead to improved recommendations with better parameters guiding the use of irrigation for cooling the cranberry canopy.

This project was funded at an ideal time where growers can adopt this technology

If the project built on a previously funded project with the SCBGP or SCBGP-FB describe how this project complemented and enhanced previously completed work.

N/A

PROJECT APPROACH

Briefly summarize activities and tasks performed during the entire grant period. Whenever possible, describe the work accomplished in both quantitative and qualitative terms. Specifically, discuss the tasks provided in the Work Plan of the approved project proposal. Include the significant results, accomplishments, conclusions and recommendations. Include favorable or unusual developments.

A) Activities 2013.

A FLIR 640 thermal infrared camera was purchased and received in April, 2013. In addition to the camera supplies related to the camera have also been procured. These supplies were included in the approved project plan and included; The Examiner IL Recording and Analysis Software Package, Optional Lens (T6xx Series), Optional Lens (#T197914), Battery (3T198055)

Much of the work with this camera was focused on developing proper protocols for conducting measurements.

Funding expended in 2013: $36,990 (100% of grant awarded)

B) Activities 2014

a) Investigate the relationship of temperature measurements using thermocouples versus thermography. Canopy temperature is typically monitored using thermocouples in either an uncovered within canopy placement or a shaded placement. These differing methods yield significantly different results depending on the time of day and climatic conditions. Since we are attempting to accurately measure canopy temperature studies will be conducted on the relationship of thermocouple placement with canopy temperature as measured by thermography.

Canopy temperatures were investigated at several distances from the canopy . It was found that in order to successfully record the temperature of an entire plot (~30' x 30") it was necessary to be 30-40' above the canopy. For this reason a hydraulic lift was rented and used to record canopy temperatures.

Fig. 1. A hydraulic lift was used in this research project to elevate above the canopy and record canopy temperatures.

The majority of data collection was conducted during Mid August and early September when climatic conditions were optimal for developing stress in the cranberry plant.

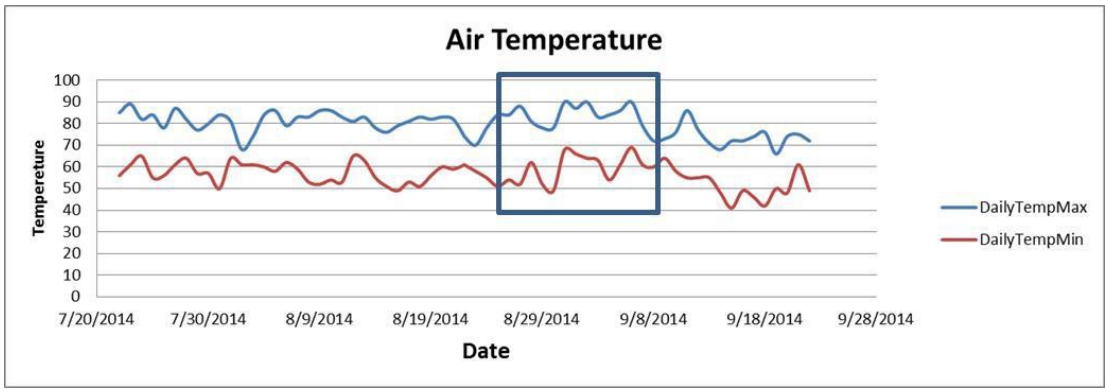
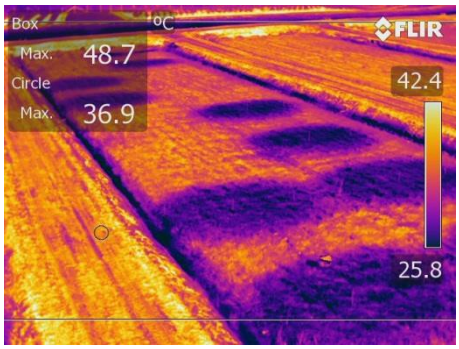


Fig. 2. Graph showing air temperatures during the summer of 2014. Box indicated timing of the majority of data collection conducted under this grant.

b) Investigate the impact of cooling irrigation on the canopy temperature. In a project recently funded by the New Jersey Cranberry Research Council work is being conducted at the Philip E (PE) Marucci Center to investigate the impact of cooling runs on canopy temperature and carbon assimilation. We propose to improve the execution of this experiment by conducting time-lapse recordings of canopy temperature to investigate the magnitude of the temperature change during and after cooling runs.

Cooling experiments were conducted using mist irrigation. The plots were located in a cranberry bed with equipped with a automated cooling system. Treatments included two trigger temperatures and an untreated control. The cooling runs were imitated at either 90F or 95F and runs were programmed to last 30 minutes after misting was triggered. Microsensor thermocouples (Spectrum Technologies) were attached to new-growth uprights of cranberry plants throughout a bed located at the PE Marucci Center in Chatsworth, NJ. Thermocouples connected to a data logger recorded temperature every ten minutes from June to September 2012-2014. Thermal images were collected concurrent with thermocouple logging. There typically existed a 5-10°F difference in recorded temperature between thermocouples and thermography upon mild or moderate air temperature whereas temperatures differed by more than 10°F upon extreme air temperatures during heat waves. The difference in temperature between thermocouples and thermography was associated with excessive heat accumulation on fruits as opposed to surrounding vegetative growth which is able to expel heat through transpirational cooling. Therefore, canopies with a heavier fruit load have greater heat accumulation and larger variation between thermocouples and thermography.

Alongside the previously described three-year study investigating thermocouple- thermography relationship, thermography was used to describe the effects of canopy cooling with mid-day irrigation to alleviate heat stress in cranberry production. Mid-day irrigation was applied when the canopy temperature reached 90°F, 95°F, or no irrigation applied (control). Significant reductions in canopy temperature by irrigation as described with thermography correlated with improved health and physiological function of cranberry plants leading to improved yields upon harvest in September. Thermal imagery was collected during the latter part of August, 2014 when the first high temperatures of the season were encountered. Data was recorded to document the magnitude of cooling as well as through time-lapse to determine duration of the cooling effect. Thermography revealed that moderate air temperature can impose significant heat stress to cranberry vegetation and fruits and that midday irrigation can effectively lower canopy temperature below the threshold for stress onset. Results of this project are attached as a PowerPoint presentation

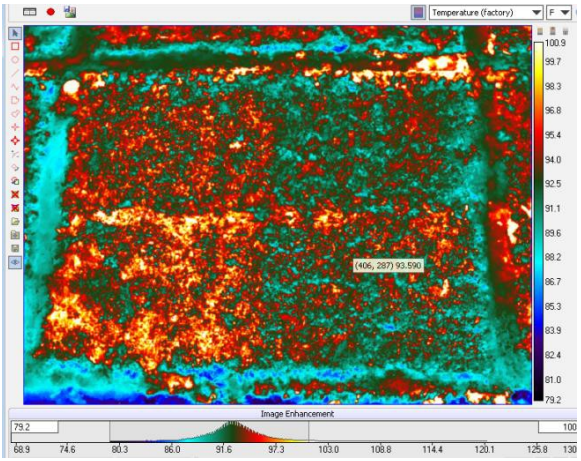


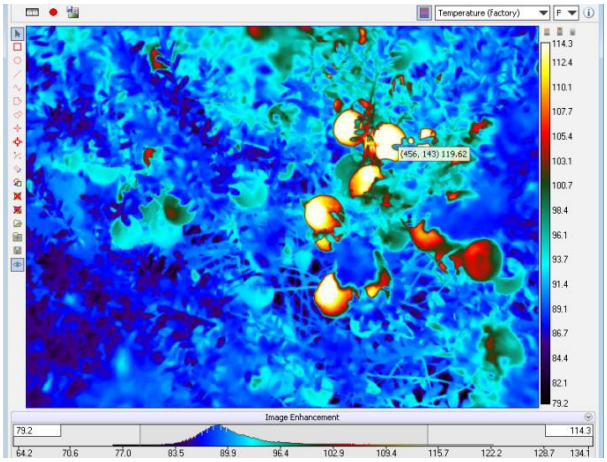
that was presented at the annual winter meeting of the American Cranberry Growers Association.

Fig. 3. An overview of the cooling experiment taken from the hydraulic lift. Temperatures are represented by color and 25.8C to 42.4C.

c) *Investigate canopy temperature during periods of heat stress.* In the experiment described above we will also investigate canopy temperature under different irrigation regimes. Using time-lapse thermography we compare how canopy temperatures respond when placed under water-stress. These investigations will help parameterize the use of cooling runs for heat management

Experiments investigating the effect of disease management strategies on canopy temperature was investigated in field plots. In this experiment 10 varieties were compared for disease development with 4 fungicide regimes. Results indicated that significant difference in canopy





resulted from increased fruit loads. The increased temperatures also were implicated in significant crop loss as a result of overheating. This research lead to a series of unexpected results showing how fruit temperature can lead to increased canopy temperature and how individual fruit can overheat while canopy temperature remains relatively cool. Our results suggest that temperatures of 30F can exist in the canopy between fruit and foliage. Results of this project are attached as a PowerPoint presentation that was presented at the annual winter meeting of the American Cranberry Growers Association.

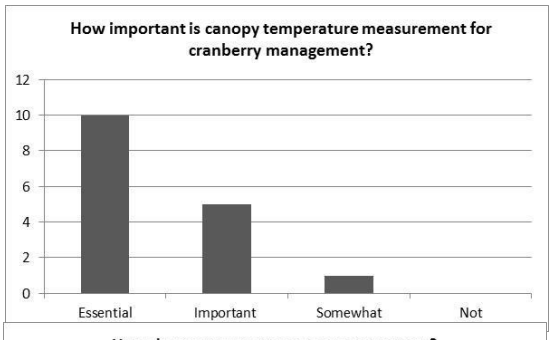
Fig. 4. Image on the left shows temperature variations within a single plot of cranberries. Differences among fungicide treatments are clearly visible and are likely the result of fruit load. The image on the right indicates smaller scale variations and highlights the differences between foliar and fruit temperatures.

At the summer meeting of the American Cranberry Growers Association (Aug 22, 2014) a survey was conducted among growers to determine the baseline knowledge of canopy temperature measurement.

At the summer meeting of the American Cranberry Growers Association (Aug 22, 2014) a survey was conducted among growers to determine the baseline knowledge of canopy temperature measurement.

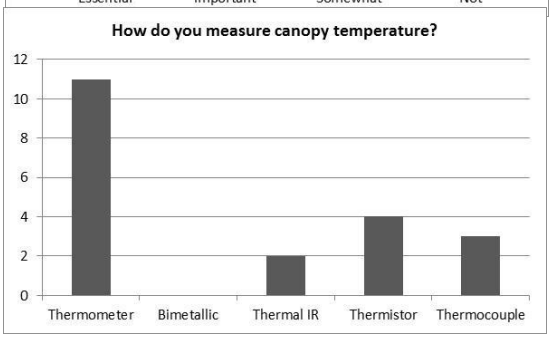
The results of the survey are presented below.

How important is canopy temperature measurement for cranberry management?
Growers overwhelmingly agree that temperature measurements are essential/important for cranberry production.



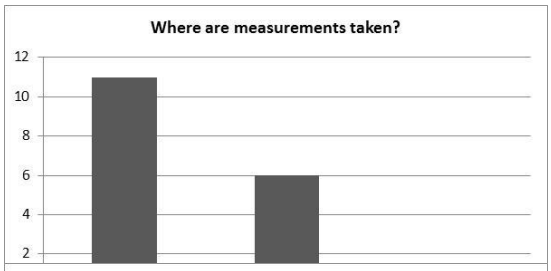
1. How do you measure canopy temperature?

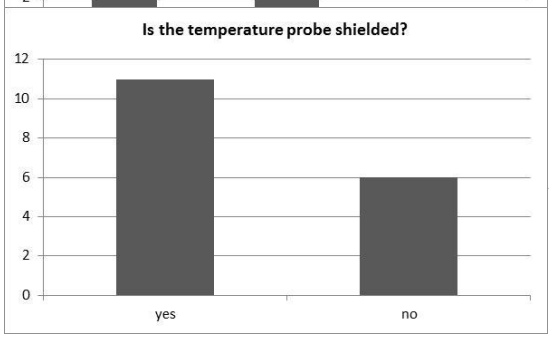
Typically growers utilize thermometers for canopy measurements however some are other methods



2. Where are the measurements taken?

For the most part growers collect canopy temperatures either just within the canopy or slightly above the canopy. Very few measure outside the bed.



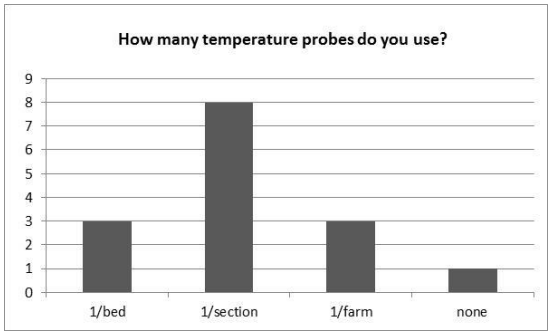


3. Is the temperature probe shielded?

Temperature probes are typically shielded to prevent direct heating of the probe from sunlight. However, shielded probes are less responsive to frost development. More growers utilize shielded probes.

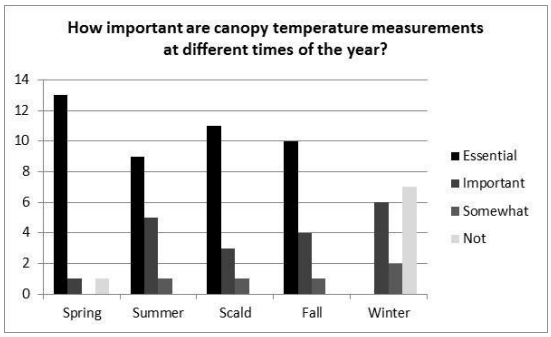
4. How many temperature probes do you use?

Typically growers manage farms by section and as expected temperature measurements are made on a per section basis.



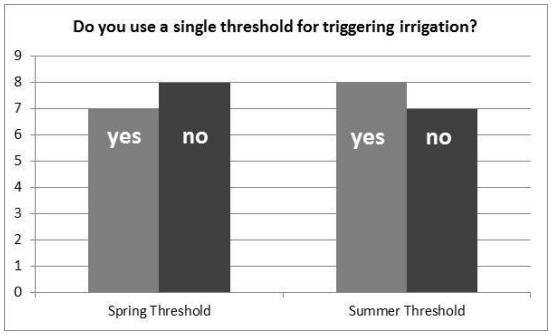
5. How important are canopy temperature measurements at different times of the year?

The need for temperature measurement and reasons change throughout the year. Nearly all growers considered measurements for spring frost to be essential. During the summer months heat stress and scald monitoring were essential most growers as was fall monitoring for frost. Winter temperature monitoring was a lower priority.



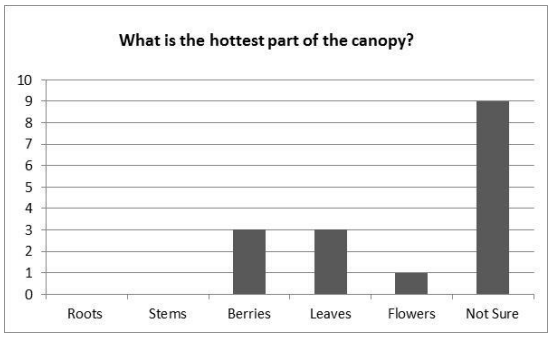
6. Do you use a single threshold for triggering irrigation?

Thresholds may change du to plant development. I expected thresholds to change in the spring during bud break due to increasing temperature sensitivity. It turns out that a surprising number of growers use a single threshold.



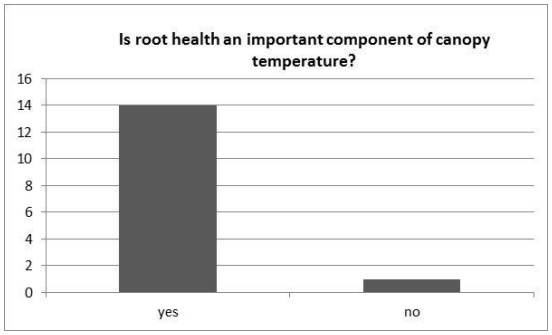
7. What is the hottest part of the canopy?

Most respondents were not sure which parts of the canopy was hottest. Therefore it is difficult to measure the appropriate tissues. We have found exposed fruit are the most vulnerable to overheating.



8. Is root health an important component of canopy temperature?

Growers are well aware of the relationship between canopy temperature and root health

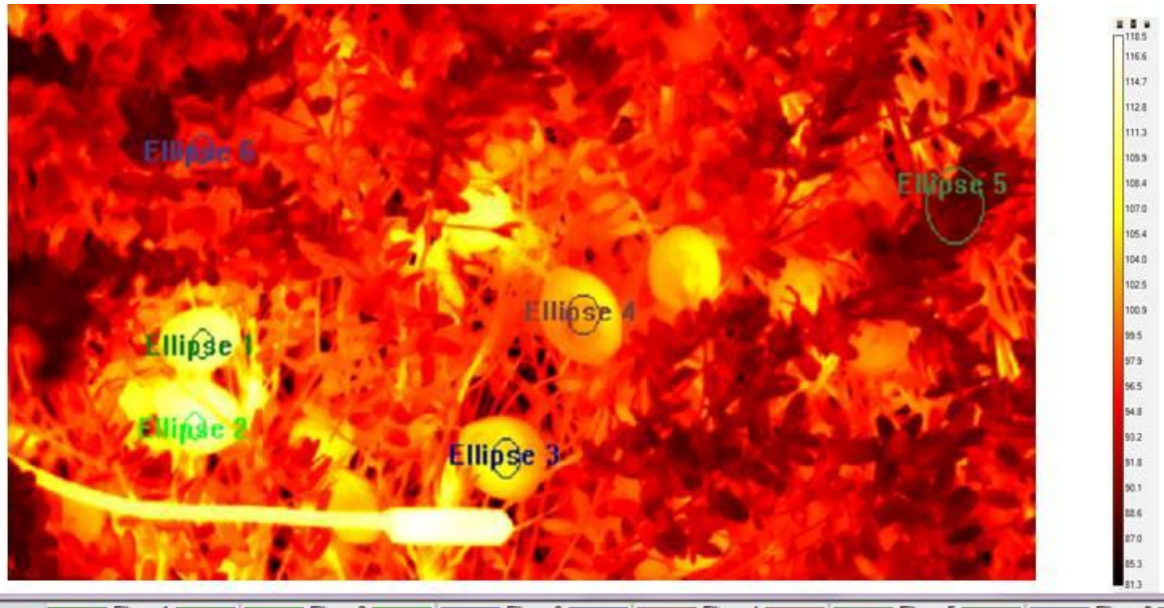


Results of research conducted during the summer of 2014 was presented at the winter meeting of the American Cranberry Growers Association (Jan. 22, 2015). At this meeting two presentations were made (Oudemans and Burgess). Powerpoint presentations are attached. Results and ensuing discussion at the ACGA meeting has already resulted in growers investing in thermal cameras for evaluating canopy condition.

C) Activities 2015

In 2015 several activities were performed under the original objectives. The relationship between canopy temperature measurements and fruit temperatures was measured. The objective was to better understand the accuracy of canopy temperature measurements for detecting periods of stress where damage to the fruit would be incurred.. In Fig 5 it can be seen that fruit surface temperatures between 102 – 113.9F were recorded while canopy temperatures ranged from 89 – 94.2F. This was considered a significant disparity and we believe that damage could be inflicted on fruit while canopy temperatures remain below the 95F threshold for cooling irrigation runs.

Fig. 5. A thermal image taken of the cranberry canopy during between 2-3pm on Aug. 12, 2015. Canopy and fruit temperatures are measured inside six ellipses illustrated below. The average temperatures inside of each ellipse are provided in the table below. A temperature probe can be seen running along the bottom of the image.



Statistic [units]	Ellipse 1	Ellipse 2	Ellipse 3	Ellipse 4	Ellipse 5	Ellipse 6
Mean [°F]	111.3	113.9	105.4	102.0	89.0	94.2
Std. Dev. [°F]	0.7	0.9	1.0	1.0	2.5	0.7
Center [°F]	(128.0, 253.0) 110.9	(124.0, 293.5) 114.3	(283.0, 309.5) 106.4	(322.5, 238.5) 102.9	(512.5, 184.5) 87.7	(127.5, 156.5) 94.4
Maximum [°F]	(132, 255) 112.3	(127, 292) 115.2	(280, 316) 107.2	(325, 230) 104.6	(511, 167) 100.5	(127, 151) 96.6
Minimum [°F]	(124, 252) 110.0	(120, 296) 111.7	(289, 313) 103.4	(317, 244) 99.3	(512, 179) 86.7	(126, 159) 93.2

Since there was no data available on the relationship of fruit surface temperature and internal temperatures we conducted a series of experiments to measure internal temperatures. In Fig. 6 it can be seen that the fruit internal temperature increased to as much as 110F while shielded temperatures (typical of normal temperature measurements) did not exceed the 95F threshold for cooling. Also, fruit color and fruit position in the canopy greatly influenced the internal temperature of the fruit. We found red fruit temperatures were significantly higher than green fruit and shaded fruit was cooler than exposed fruit. These general findings correlate well with the thermal camera observations of fruit surface temperatures and identify a source of significant crop loss that is caused by overheating due to solar radiation.

Fig. 6. Graph showing shielded air temperature and internal berry temperature during the summer of 2015. Comparisons fruit of different colors (green-red) and position in the canopy (degree of shading) show the impact of color and position on the internal berry temperatures.

To help educate growers without purchasing expensive thermal cameras we introduced the use of small meat thermometers to measure internal fruit temperatures. In Fig. 7 we present an example of meat thermometer being used to test internal berry temperature.

Fig. 7. A inexpensive meat thermometer being used to probe the internal berry temperature of a cranberry.

This information on internal berry temperature was not useful with developing thresholds. Since no thresholds were available these were developed for 10 different cranberry varieties. In general it was found that after incubating fruit in a hot water bath that similar symptoms could be induced as were seen in the field. Thus experiments were conducted by holding fruit under water at set temperatures for 2hrs. The results were then measured by testing the firmness of the fruit immediately following the treatment and 48hrs later.

Based on these results we established that 110F was the maximum internal temperature that cranberries could withstand before becoming soft and beginning to decay.

Fig. 8. Image showing the appearance of cranberry fruit following 2hr of incubation in a hot

water bath at the temperatures described.

Based on the research conducted thus far we began to investigate two methods for managing over heating of cranberry fruit. The first was irrigation to provide evaporative cooling and the second was to evaluate the use of a kaolinite clay product (Surround) which is advertised to prevent sunburn or over heating of fruit.

To assess the value of irrigation for cooling fruit several questions were raised. For example, how much cooling can irrigation offer, how much irrigation (duration) is required and finally do the negative effects of irrigation (increased fungal disease) negate the benefits? To approach these questions and to examine the feasibility of irrigation we conducted several cooling experiments to measure the impact of internal berry temperature. In Fig. 9 we measured internal berry temperature before, during and following a 30 min. irrigation during early afternoon on July 29, 2015. These data demonstrate that both internal berry temperature and shaded canopy temperature dropped almost immediately following the initiation of irrigation. While berry temperatures rose back to pre-irrigation levels after approximately 2hrs canopy temperatures remained lower.

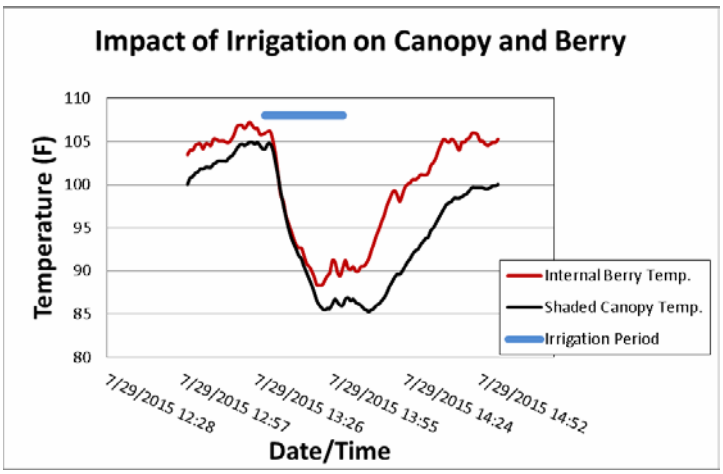
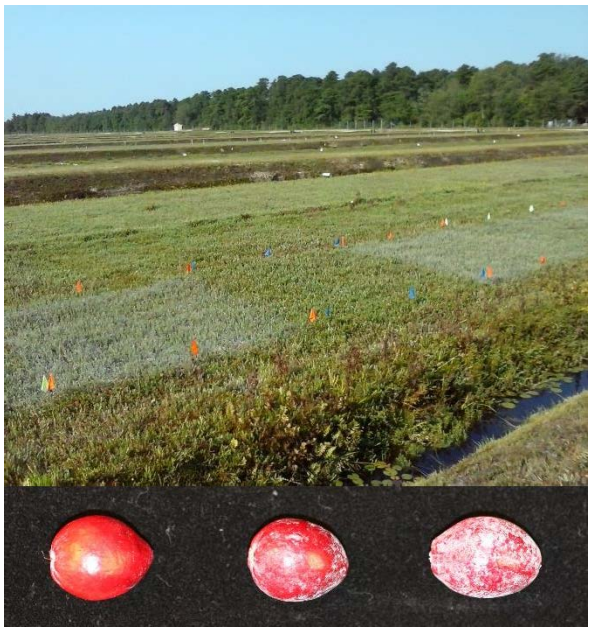


Fig. 9 Internal berry temperatures measured before, during and following an irrigation event.

In the second temperature control experiment the kaolinite clay product, Surround, was used at two levels (25 and 50 lb/acre) to coat fruit and protect from over-heating (Fig. 10).

Fig. 10. Field trial using Surround to coat canopy and fruit to test for protection from over-heating. In the upper panel the coating of clay on the canopy can be clearly seen. On the lower panel the coverage on fruit is obvious.



These treatments were evaluated by collecting thermal camera imagery over each plot and measuring fruit temperature in each image. The experiment consisted of three treatments and 3 replications and was conducted twice. The results (Fig.11) demonstrate that average temperature during periods of stress was depressed by the treatments and fruit surface temperatures were held below threshold of 110F at both levels of clay application.

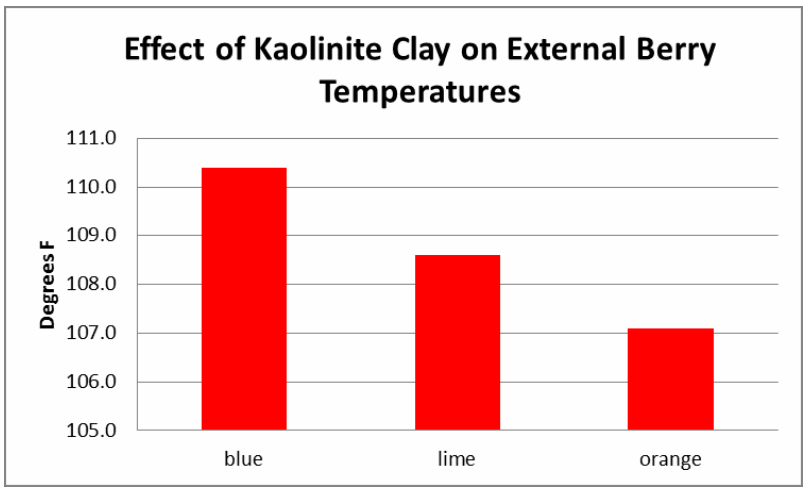


Fig. 11. Fruit surface temperature of fruit treated with kaolinite clay at 0lb/acre (blue) 25lb/acre (lime) and 50lb/acre (orange).

The results of this study show that small temperature reductions (just a few degrees below the 110F threshold) can have dramatic effects on fruit quality and yield.

At the summer meeting of the American Cranberry Growers Association (Aug 21, 2015) a second survey was conducted among growers to determine the advances in knowledge of canopy temperature measurement. The results show that growers have increased awareness of canopy temperatures and will increasingly invest in methods for its control and management.

A PowerPoint presentation illustrating this years accomplishments is attached.

If the overall scope of the project benefitted commodities other than specialty crops, indicate how project staff ensured that funds were used to solely enhance the competitiveness of specialty crops.

N/A

Present the significant contributions and role of project partners in the project.

Patrick Burgess and Bingru Huang. Contributed to the research efforts aimed at canopy cooling for improved photosynthetic rates

NJ Cranberry Research Council. Provided additional funding to conduct research on canopy temperatures

GOALS AND OUTCOMES ACHIEVED

Describe the activities that were completed in order to achieve the performance goals and measurable outcomes identified in the approved project proposal or subsequent amendments.

a) *GOAL: Improve grower understanding of how to measure and standardize measurement cranberry canopy temperature.*

Under this project we were able to accurately describe temperature differences among different parts of the canopy and at different developmental stages. This information has provided growers with a better understanding of what traditional canopy temperature measurements represent.

b) *GOAL: Improve grower understanding of how to implement irrigation for cooling the cranberry canopy. For example, what is the expected magnitude of temperature drop following 30 minutes of irrigation?*

Canopy cooling was studies from two perspectives in this project. In the first, we were able to demonstrate that canopy cooling can provide significant effects on yield components such as carbohydrate accumulation. Cooling runs were examined from the perspective of impact on canopy temperature and climatic conditions (in particular relative humidity, wind speed and temperature) can have a significant impact on the magnitude and duration of cooling effects. The impact of climate on canopy cooling (evaporative cooling) was demonstrated to growers.

c) *GOAL: Improve grower understanding of how to identify cranberry beds that are more vulnerable to heat stress due to a new disease called Footprint. Growers will use this information to invoke stricter canopy temperature management methods. Specifically, canopy temperatures will be monitored around diseased areas and the trigger for cooling irrigation will use these values. Also, the importance of disease control will be illustrated.*

Work to achieve this goal was hampered by the fact that sufficient distance from the canopy in areas with disease were hard to reach. This goal is now being realized under a new project where drones equipped with thermal sensors. However, under this project the variability of thermal data is better understood and it is anticipated that vines suffering from root stress will exhibit the greatest thermal response during periods of heat stress.
We are currently working on methods to identify stress conditions.

d) *GOAL: Improve grower understanding of how to identify cranberry beds that are more vulnerable to heat stress due to Phytophthora root rot. Growers will use this information to invoke stricter canopy temperature management methods. Specifically, canopy temperatures will be monitored around diseased areas and the trigger for cooling irrigation will use these values.*

Based on new information developed under this project we are characterizing the characteristics of canopies that allow heat stress to occur. Specifically, plant phenology and canopy thickness appear to be important characteristics to consider before invoking irrigation these characteristics in combination with climatic conditions can be used to improve canopy cooling and heat stress reduction.

e) *GOAL: To develop new commercially available cranberry varieties that exhibit superior heat tolerance*

Preliminary data on cultivar variation was collected. It appears that significant variation exists among cultivars however, replication of germplasm plantings is necessary before such an experiment can be conducted.

If outcome measures were long term, summarize the progress that has been made towards achievement.

A new planting with novel germplasm was planted in 2015. This trial includes 12 genotypes with sufficient plot size (10’ x 20’) and replication (4) to provide an experimental design.

Provide a comparison of actual accomplishments with the goals established for the reporting period.

Actual Accomplishments	Goals
Grower understanding of canopy temperature is greatly improved.	*Improve grower understanding of how to measure and standardize measurement cranberry canopy temperature.*
Growers have a greater appreciation for climatic conditions in relation to evaporative	*Improve grower understanding of how to implement irrigation for cooling the*

cooling. It is anticipated that Wet and dry bulb temperatures will be reported through local weather reporting so that the maximum cooling on a particular day can be determined.	*cranberry canopy. For example, what is the expected magnitude of temperature drop following 30 minutes of irrigation?*
The timing of measurements for identifying impact is improved. Results will be applied to thermal measurements made using drones.	*Improve grower understanding of how to identify cranberry beds that are more vulnerable to heat stress due to a new disease called Footprint. Growers will use this information to invoke stricter canopy temperature management methods. Specifically, canopy temperatures will be monitored around diseased areas and the trigger for cooling irrigation will use these values. Also, the importance of disease control will be illustrated.*
Experimental variation is understood and steps have been taken to plant in a manner suitable for experimental validation.	*To develop new commercially available cranberry varieties that exhibit superior heat tolerance*
A threshold for fruit damage has been established	Not in the original proposal
An inexpensive method for measuring fruit temperature has been established	Not in the original proposal
Cooling to prevent scald has been better characterized and growers are testing different strategies to incorporate our information	Not in the original proposal
Demonstrated that risk of scald increases as fruits ripen	Not in the original proposal
Identified periods of high risk for scald	Not in the original proposal

Clearly convey completion of achieving outcomes by illustrating baseline data that has been gathered to date and showing the progress toward achieving set targets.

Highlight the major successful outcomes of the project in quantifiable terms.

BENEFICIARIES

Provide a description of the groups and other operations that benefited from the completion of this project's accomplishments.

Cranberry growers in NJ have benefitted from the research conducted under this project. Presentations to grower groups in BC, MA, and PEI have extended the benefits to these grower groups.

Clearly state the number of beneficiaries affected by the project's accomplishments and/or the potential economic impact of the project.

Over 30 cranberry growers in NJ representing approximately 3100 acres of producing beds are the immediate beneficiaries

LESSONS LEARNED

Offer insights into the lessons learned by the project staff as a result of completing this project. This section is meant to illustrate the positive and negative results and conclusions for the project.

The use of thermal imagery has had several positive and negative effects.

1. This imagery provides, for the first time, a unique view of the canopy and its thermal properties.
2. The project did not progress in a completely predictable direction because we thought it would be easy to capture plant stress due to root disease however this was more problematic. On the other hand we learned a great deal about fruit degradation due to overheating (scald).
3. The initial response of growers to this information caused a limited amount of over irrigation. This response should have been predictable. In the future I would suggest extending the results more gradually to growers so that pitfalls can be determined before the practices are implemented.

Describe unexpected outcomes or results that were an effect of implementing this project.

As described above significant unexpected findings under this project stem from the improved understanding of berry over-heating (scald)

If goals or outcome measures were not achieved, identify and share the lessons learned to help others expedite problem-solving.

The biggest obstacle to detecting root disease is the value of elevation. From the ground the differences are not always obvious. This technology will be very applicable when using an aerial platform.

Lessons learned should draw on positive experiences (i.e., good ideas that improve project efficiency or save money) and negative experiences (i.e., lessons learned about what did not go well and what needs to be changed).

CONTACT PERSON

Peter V. Oudemans
Professor, Plant Pathology
PE Marucci Center Rutgers
University

125a Lake Oswego Rd.
Chatsworth, NJ 08019

(609) 726-1590 ext 4420
(609) 726 1593 FAX
(609) 204-2371 cell
oudemans@aesop.rutgers.edu

ADDITIONAL INFORMATION

Provide additional information available (i.e. publications, websites, photographs) that is not applicable to any of the prior sections

See attached presentations.

Rutgers Cooperative Extension of Cape May County
SCBG Agreement # 12-25-B-1476
Final Performance Report
October 26, 2015

Project Title
"Annie's Project 2013 for New Jersey Greenhouse Growers"

Project Summary
The aim of Annie's Project 2013 for New Jersey Greenhouse Growers was to provide entrepreneurial, production and management skills to women who operate greenhouses. The interactive workshops provided information on financial management, cost accounting, marketing, and labor management and production techniques. Through a series of interactive training sessions, educators focused on training and facilitating all participants in creating a business plan for their greenhouse businesses. The female greenhouse managers will sustain networking relationships through the use of social media tools in order to share business and marketing strategies during the course and long after the course is completed. The goals of this project were to: 1) Have 90% of the participants develop a business plan for their specialty crop enterprise; 2) Increase the economic success of greenhouse specialty crop growers in New Jersey; and 3) Provide the participants with networking opportunities with other greenhouse growers in their region. Annie's Project is a nationally acclaimed farm business management course for women. The Annie's Project 2013 for New Jersey Greenhouse Growers course targeted issues that women greenhouse operators face in order to enhance their competitiveness in the specialty crops market.

Competition in the green industry in the northeastern United States has become fierce. Many factors have put downward pressure on price including the recent volatility of fossil fuels and general energy prices, domestic competition, off-shore production, a weakened and stressed economy, and the growth of the mass market. Nationally, the number of producers continues to decline as a direct result of the newly defined economic risks. The industry's profit margins are typically low, leaving little room for growers to absorb significant increases in costs or decreases in revenues. Unlike farmers who produce field crops, greenhouse firms bear the entire price, market, and production risks because these crops have had minimal government support programs. Greenhouse crop producers must hone their marketing, management and production skills to continue to survive and respond to current trends.

Consumer demand has also been changing. One of the most widely discussed topics in the Green industry today is the issue of environmental sustainability brought about by consumers with a greater degree of environmental awareness. This has led to a desire for products that not only solve the needs of consumers but are also produced and marketed using sustainable methods. A greater emphasis has also been placed on the environmental dimensions of packaging for plants and floral products. The severe economic recession of 2007-09 has placed considerable financial strain on these businesses. For greenhouse firms to survive in the long run, managerial decision-making must be based on accurate and timely production and marketing information.

Project Approach

The project began in August of 2013, when the team finalized the exact content for each day and found local experts and colleagues from Rutgers as workshop instructors. The project team researched and assembled additional related resource material. The schedule was three hour long classes (6-9 pm) running for seven weeks beginning in January of 2014.

Instructors and presenters included team members, professional colleagues, legal experts, industry professionals, representatives from farm organizations such as Farm Credit, Farm Bureau, the New Jersey Department of Agriculture and specialty crop producers that were chosen for their experience in working with Annie's Project participants and their expertise in farm business management and greenhouse production.

We made use of existing materials from RCE, extension, and other U.S.D.A. sources. The workshop curriculum included the use of existing materials such as the Center for Farm Financial Management Business Plan, the Rutgers Business Plan workbook, the Rutgers Cost Accounting Software, LED lighting technology and practices (see http://leds.hrt.msu.edu/). Rutgers Cooperative Extension has a very comprehensive personal finance website with dozens of worksheets (see http://njaes.rutgers.edu/money2000/) as well as a farm financial management website (see http://www.cook.rutgers.edu/~farmmgmt/index.html) and a crop insurance website (see http://salem.rutgers.edu/cropinsurance/). These resources were all utilized in this program.

We had originally planned the program for June 2013-August 2013 as we had thought we would get more greenhouse growers in the summer. After surveying we found many growers travel over that time, so the choice was made to host the program in January 2014-February 2014. This also allowed ample time for advertising which we have found needs to begin four months prior to the program. We believe this decision led to the high enrollment numbers we have in the program. The change in the timeline was approved by NJDA due to the date the grant runs through.

The "project steps" table delineates the time frame the project steps were completed in order to meet the objectives.

Done	Key Tasks	Timeline
X	Meet and plan dates, specific content, and marketing plans for the workshops. Discuss other potential collaborators to market the program.	August 2013-December 2013
X	Discuss workshop content, design, and speaker expertise required. Identify farmers, colleagues, and agricultural support people as speakers.	August 2013-December 2013
X	Follow-up and confirm suggested speakers	August 2013-December 2013
X	Identify, purchase and compile educational materials for workshops	December 2013-January 2014
X	Make speaker travel arrangements, reserve locations	September 2013

X	Update workshop evaluations	August 2013-December 2013
X	Update media pieces (brochures, press releases, newsletter articles, e-mail announcements, websites, Facebook pages, tweets, etc.) for advertising the workshops.	August 2013-January 2014
X	Mail out brochures to women in the state, post website materials, Facebook content, send tweets, etc. Send out press releases.	November 2013-January 2014
X	Conduct workshops, administer evaluations.	January 2014-March 2014
X	Follow up with participants via Facebook, e-mail, website evaluations, mail, and/or telephone regarding additional educational materials requested and individual assistance needed using tools presented at the workshops.	September 2014-January 2015
X	Develop and conduct an email survey of workshop participants to determine what steps participants took to increase the profitability of their greenhouse enterprise.	August 2015

Goals and Outcomes Achieved

The primary purpose of *Annie's Project for New Jersey Greenhouse Growers* was to provide entrepreneurial and management skills for traditionally underserved farmers (women) who operate greenhouses. The goals of this project were to: 1) Have 90% of the participants develop a business plan for their specialty crop enterprise; 2) Increase the economic success of greenhouse specialty crop growers in New Jersey; and 3) Provide 100% of the participants with networking opportunities with other greenhouse growers in their region that will enhance their competitiveness in this challenging market.

Goal 1: Have 90% of participants develop a business plan for their greenhouse specialty crop enterprise.

This goal was met with the exception of the financial plan which 80% of participants have completed.

A final online survey was conducted in August 2015 to measure the portions of the business plan that were completed 18 months after the course ended.

Portion of Plan	Partially Completed	Completed	Total
Mission Statement	29%	71%	100%
Business Description	32%	68%	100%
Production Plan	62%	38%	100%
Marketing Plan	60%	40%	100%
Management Plan	60%	30%	90%

Financial Plan	50%	30%	80%
Executive Summary	67%	33%	100%

Business plans submitted through agplan.umn.edu were reviewed and commented on.

We also asked, "If applicable, what were some of the reasons you were unable to finish your business plan?" Responses included:

- "Time"
- "Very busy doing markets and working on farm"
- "Time, financial info needed"

The majority of respondents indicated that using their business plans helped improved their business. The numbers below are the percent of respondents that affirmed that they used the portions of their business plan to improve their farm business:

- Production Plan: 82%
- Marketing Plan: 90%
- Management Plan: 73%

Goal 2: Increase the economic success of greenhouse specialty crop growers in New Jersey.

Specialty crop growers in this course are currently growing the following crops

- Herbs
- Aronia
- Tomatoes
- Blueberries
- Peppers
- Kale
- Eggplant
- Cucumbers
- Pumpkins
- Aquaponics (Bass and leafy greens)
- Radish
- Turnips
- Native Plants (flowers, shrubs, trees)
- Native medicinal plants
- Hydroponic micro greens

As of August 2015, 60% of specialty crop grower participants indicated that they have increased their farming income as a result of this program. When asked, "How much has your annual gross income increased from farming as a result of participating in the Annie's Project Greenhouse Growers program", the results were as follows:

- $0: 40%
- $1-$1,000: 20%
- $1,001-$5,000: 30%

- $25,001-$30,000: 10%

Goal 3: Provide 100% of the participants with networking opportunities with other greenhouse growers in their region.

As of the last day of the course, 100% of participants indicated they had networked with other participants.

When asked, "What benefits did you gain as a result of the networking", the results were as follows:

- Business relationships (gaining buyers, sellers or investors)
- Learning farming techniques (learning from others about crops, environmental conservation, marketing or finances)
- Social (developing friendships and support systems)
- Other (non-specified)

Beneficiaries

Female specialty crop producers of greenhouse and floriculture crops will be the beneficiaries of this proposed program. Annie's Project has proven successful as a comprehensive educational program and support network for women farmers, in helping them to learn to understand and manage their businesses. The curriculum focuses on business and family financial management with opportunities to learn specifics about legal aspects, marketing, business planning, finances, insurance, communications and other important topics. One significant component of Annie´s Project is the opportunity for women to network with other women who are involved in agriculture in their geographical area. We facilitated networking with other female greenhouse managers through the use of personal contact and social media tools to share business and marketing strategies during the course and long after the course was completed.

While our original goal was getting 30 participants for our *Annie's Project NJ for Greenhouse Growers* Program, we had 31 women and 3 men enroll. The classes were held at the Rutgers Cooperative Extension Office of Burlington County from January 14, 2014-March 4, 2014. Classes were held Tuesday evenings from 6-9 and webinars were held Thursday evenings from 7-8 pm. Thirty-three participants completed 18 hours of in-person instruction and attended 6, one hour long webinars.

Lessons Learned

As stated previously, the time of year has to be selected carefully for a project to be successful. It must take into account the type of farmers we are educating which in this case was greenhouse growers. After surveying we found many growers travel over the summer, so the choice was made to host the program in January 2014-February 2014 instead of over the summer months.

Additional Information

2014 Annie's Project NJ: Greenhouse Growers Course

All classes held at Burlington County Cooperative Extension
Webinars are viewed from your home *(information is subject to change without prior notice)*

TOPICS		
January 14 – *Business Plan*		
TIME	**Title of Presentations**	**Presenters**
6:00-6:30PM	Why Have a Business Plan? Intro to AgPlan Website	Dr. Robin Brumfield
6:30-7:30	Developing a Business Description, Mission/Vision Statement and Objectives for your Farm	Jenny Carleo
7:30-8:00	Work Session, workbook pages 7-13	x
8:00-9:00	SWOT Analysis	Dr. Robin Brumfield
January 16 – *Webinar*		
7:00-8:00PM	Do's and Don'ts of a Business Plan	Jenny Carleo
Homework – SWOT Analysis Workbook, Pages 14-17		
January 21 – *Production Plan*		
6:00-6:30PM	Review SWOT analysis Homework, Network	Meredith Melendez
6:30-7:15	Greenhouse Crop Selection	Bill Swanekamp, Kube Pak
7:15-7:45	Production Plan	Dr. Robin Brumfield
7:45-8:30	Cost Accounting, Financial Statements and Ratios	Dr. Robin Brumfield
8:30-9:00	Pricing	Dr. Robin Brumfield
January 23 – *Webinar*		
7:00-8:00PM	Financial Statements	Dawn Edmonds, Farm Credit
Homework – Risk Management Plan, Pages 28-29		
January 28 – *Greenhouse*		
6:00-6:30PM	Review Risk Management Plan Homework, Network	Meredith Melendez
6:30-9:00	Greenhouse Structures and Systems, Greenhouse Energy and Irrigation Issues	Dr. A.J. Both
January 30 – *Webinar*		
7:00-8:00PM	Supplemental Lighting and Shading	Dr. A.J. Both
Homework – VirtualGrower		
February 4 – *No Class*		
February 6 – *Greenhouse Marketing Webinar*		
7:00-8:00PM	Greenhouse Marketing Webinar	Bridget Behe and Jennifer Dennis
February 11 – *Marketing*		
6:00-6:15PM	Review Homework	Meredith Melendez
6:15-7:15	Greenhouse Entomology	Steve Rettke
7:15-7:45	Marketing	Rick VanVranken

7:45-8:20	Market to Market Workbook	Dr. Robin Brumfield
8:20-9:00	Work Session	x
February 13 – *Webinar*		
7:00-8:00PM	Greenhouse Apps	Amy Fulcher, University of Tennessee
Homework – Finish a Marketing Plan For Your Farm, Pages 30-35		
February 18		
6:00-6:30PM	Review Marketing Plan	Meredith Melendez
6:30-7:30	Women and Money	Dr. Barbara O'Neill
7:30-8:00	Work Session, Simplified Financial Plan	x
8:00-8:30	Labor Management	Bill Swanekamp, Kube Pak
8:30-9:00	Leadership and Management	Nick Polanin
February 20 – *Webinar*		
7:00-8:00	Affordable Care Act	Dr. Barbara O'Neill
Homework - Financial Plan and Management Plan, Pages 35-48		
February 25 – *Greenhouse*		
6:00-6:30PM	Review Financial Plan and Management Plans	Meredith Melendez
6:30-9:00	Disease Basics: What Are They, How Are They Spread, and How Are They Managed?	Dr. Ann Gould
February 27 – *Webinar*		
7:00-8:00PM	Common Diseases of Greenhouse Ornamentals: Symptoms, Signs, and Management	Dr. Ann Gould
Homework – Work on Business Plan		

Contact Person

Jenny Carleo
(609) 465-5115
Carleo@aesop.rutgers.edu

Cooperative Growers Association
SCBG Agreement #12-25-B-1476
Final Performance Report
January 15, 2015

Project Title;
"The Reestablishment of Wholesale and Retail Produce Sales"

PROJECT SUMMARY;
The purpose of this project was to reestablish wholesale and retail produce sales at the Cooperative Growers Association in Tabernacle, New Jersey. After many years of operation the Co-op had ceased selling fresh product and had become primarily a source of group purchases for grower supplies like fertilizer and seedlings. The project sought to recreate a revenue stream from the sale of fresh fruits and vegetables.

The Cooperative Growers Association long tradition of grower assistance was in jeopardy as sales of grower supplies had been in decline. The re-introduction of fruit and vegetable sales was intended to create an additional revenue stream for the cooperative.

This project did not build on any past SCBG projects.

PROJECT APPROACH

In accordance with the approved project plan the following activities were conducted;
Personnel expenses were incurred to erect a temporary hoop and plastic greenhouse. This is a standard and temporary process for growing especially early season specialty crops. The temporary greenhouse consisted of metal hoops over which large plastic rolls are laid. There is no foundation and no floor and no walls or roof other than the plastic which is stretched over the semi-circular metal hoops. Following the production season the hoop and plastic sheeting are dismantled and the plastic is recycled. Peggy Ballister Howells supervised the greenhouse

operation. The temporary hoop and plastic greenhouse has been dismantled, the land returned to it's original state, and the plastic recycled.

The following supplies were purchased; Nine rolls of 4 year, 6 millimeter polyether plastic for the purpose of erecting the greenhouse.

Travel included the expenses of Peggy Ballister Howells to attend and exhibit at the NJ Vegetable Growers Convention and Trade Show in Atlantic City. This is the largest specialty crop event annually held in the state of New Jersey.

The expenditures on supplies included;

Truck Rental x 8 months
Truck Fuel
Trade Show Rental
Meeting Room Rental

Peggy Ballister Howells supervised the following expenditures;
The expenditures for the truck rental and fuel provided the needed distribution for the sale of fruits and vegetables.

The expenditures for the Trade Show Rental covered the cost of 10' x 10' booth to promote and advertise the co-op's produce sales.

The Meeting Room expense at the NJ Vegetable Growers Convention and Trade Show expense was to promote the upcoming fresh product availability at the Co-op directly to the wholesalers. Farm market operators and other interested parties in attendance at the NJ Vegetable Growers Convention.

Through this project the Cooperative Growers Association was able to create the conditions for the production, sale and distribution of specialty crops. Through the use of the temporary hoop and plastic greenhouse specialty crops were grown or had value added, through the advertising compnant of this project demand for the specialty crop products was created and thruogh the rental of a truck the specialty crop products were distributed.

The sales generated by this project exceeded the target goal by 400%.

GOALS AND OUTCOMES ACHIEVED

Benchmark

The 2012 benchmark for sales was $200,000.

Goal

The Goal for sales was to create a 50% increase in 2013 and 25% increases in the following years.

Outcome

Through promotion and traditional sales techniques the Cooperative Growers Association had annual fruit and vegetable sales of $1,199,599 during the 2013 growing season.

Results; Instead of the projected sales of $300,000 in 2013 a total of $1.2 million were realized in that year. The outcome exceeded the goal by 400%.

BENEFICARIES

The specialty crop beneficiaries were the farmer members of the Cooperative that were seeking outlets for their products as well as the farmer members with farm markets that need to source locally the products they do not grow. In addition, the CSA was available to local residents.

The Cooperative Growers Association's approximately 150 specialty crop producers benefited from the reestablishment of produce and horticultural sales. Some were primarily for sales of their specialty crop products, some primarily for the purchasing of specialty crops produced by other growers to complement their own production and some growers will be engaging in both activities.

The benefits of this project include reducing the need for local growers to drive to the Philadelphia market to find outlets for their product which works equally for minimizing the need for buyers to have to make the same trip. It also ensured that locally produced Jersey Fresh product is locally available for sale. The buying and selling within a small geographic area encouraged better quality produce and limited transportation costs and related quality control issues.

Lessons Learned

Even successful projects do not always leave behind a successful legacy. On November 1, 2013 the Cooperative Growers ceased operation for financial reasons.

Although the project was intended to last two years the project was halted at the end of the first year's growing season in 2013. Even without the second year the project exceeded its goal of $300,000 by creating sales of $1.2 million. A 400% increase in sales was realized through this project.

Contacts

Thomas Budd
P.O. Box 2453
Vincentown, NJ 08088
609 859-1463

Rich Scozzari
Withum, Smith and Brown, PC
5 Vaughn Drive
Princeton, NJ 08540
609 520-1188
richards@creditlenders.com

SCBG Agreement #12-25-B-1476
Final Performance Report
February 2, 2014

The Garden Club of New Jersey

Project Title:
"The Garden Club of New Jersey, Inc. Community Gardens/Jersey Fresh/Jersey Grown Project"

Project Summary:

Funds sought to:

- Begin a program to educate fellow garden club members and the public by fostering programs, workshops, and projects designed to teach, inspire, beautify, and enrich our local communities.

- Protect open space and farmland. Although New Jersey is the most densely populated state development pressure continues to threatening the remaining open spaces in New Jersey. Once developed farmland seldom reverts from being developed back to farmland so the time is now to work to preserve farmland in New Jersey to ensure its availability for the future production of specialty crops.

- Create a healthier society by promoting gardening, preserving the environment, and encouraging residents to buy local and thereby support the Garden State Agricultural community by using "Jersey Fresh" and "Jersey Grown" products.

Project Approach:

Work Plan:

- Our Committee issued mini grants of up to $1,000.00 to worthy community garden projects throughout New Jersey at a time of municipality shortfalls and recovery from super storm Sandy with a goal toward generating new customers for the State's agricultural sector and expansion of participation in the Garden Club of New Jersey efforts to promote gardening and New Jersey agriculture. The grant applications and directions were readily attainable on the Garden Club of New Jersey website: www.gardenclubofnewjersey.com under Community Gardens, with a reporting form due by September 15th of the award year with the project requesting a garden club sponsor for a method of insuring the project would be worked according to the grant requirements.

- Our committee met on a monthly basis to administer the grants and plan events where we displayed our Community Gardens Education exhibit. We also sought to get the word out that our definition of community gardens included, not only, community gardens with garden plots growing fruits and vegetables which would be the "Jersey Fresh" aspect of our project, but public gardens that featured trees, shrubs, perennials and annuals representing the "Jersey Grown" aspect of our project. All of these falling under the specialty crops as outlined in our grant application, and as "spelled out" by the USDA.

  One of the most rewarding outcomes of this project is the partnerships the Garden Club of New Jersey has formed with like-minded organizations and communities including: The New Jersey Department of Agriculture, the NJ Plants Trade Show, the New Jersey Nursery and Landscape Association, the New Jersey Agricultural Community including nurserymen, farmers, growers and garden centers, Somerset County 4H Fair, Municipalities throughout New Jersey as outlined under Beneficiaries, Boy Scout and Girl Scout Troops, Youth Gardening Groups, local food banks, schools, National Garden Clubs, Inc., Crown Bees, North American Butterfly Association, Mac Events, Pollinator Partnership and Rutgers Gardens and Rutgers Extension Service, and Morris County Parks.

Goals and Outcomes Achieved:

A total of 50 grants were awarded:

1. Memorial Park Community Garden in Historic Jersey City Cemetery received a grant award of $830.00 towards tools, seeds, plants and fencing for their urban community garden started in May, 2011, enabling them to double the number of beds to eight and participants to 50, specifically educating youth and donating fresh food to food banks.

Project sponsors include Jersey City Landmarks Conservancy, Village Neighborhood Association and Terra Nova Garden Club.

2. Red Bank Community Garden received a grant of $1,000.00 for the startup of a new community garden numbering twenty plots for support of local food banks sponsored by a sub-committee of the Red Bank Environmental Commission and Navesink Garden Club.
3. Long Valley Community Garden received $1,000.00 for the startup of a new community garden with 80 plots in a 16,000 sq. garden. Project partners include Washington Township Green Team, Boy Scouts of America and the Garden Club of Long Valley.
4. All Seasons Garden Club of Morris Plains, NJ received a grant award of $500.00 for their "Roots, Shoots and Bulbs" project with 50 Scouts planting 400 daffodil bulbs in public gardens and 70 second graders planting a school garden in two raised beds.
5. The Borough of Chatham received a grant award of $470.34 to purchase a cold frame to help extend their gardening season in their community garden of 65 plots with 140 users sponsored in part by PSE&G, Kiwanis, Washington Avenue School and Town and Country Garden Club.
6. Bridgeton Community Garden, a startup of a new community garden in Bridgeton, NJ received a grant of $1,000.00 and project sponsors include the Farmworker Support Committee and Countryside Garden Club of Millville assisting Latino immigrants working in the surrounding farms and food processing centers to fresh, organic vegetables. This is a communally worked garden of 6,969 square feet.
7. Montclair Community Farms received a grant award of $1,000.00. Montclair Community Farms has expanded to a plot at the Montclair Historical Society and is administered by a coalition including HOMECORP, United Way of New Jersey, Essex County 4H, Montclair Health Department, Montclair State University, TerraNoble Design and the Garden Club of Montclair, Inc.
8. Rutherford Green Team Community Teaching Garden-Education, Beautification, and Rehabilitation Project received a grant award of $1,000.00 for restoration of public gardens damaged by super storm Sandy. The rear slope of the Rutherford Community Teaching Garden was destroyed and replanting was a key component of teaching and preventing soil erosion and pollution from the former Erie Railroad tracks. Project supporters in addition to the Rutherford Green Team include the Rutherford Garden Club, Rutherford High School Green Club and the Bergen County Master Gardeners.
9. Phillipsburg Community Garden received a grant award of $1,000.00 for improvement of their community garden of 14 raised beds established in 2012, providing food for the local NORWESCAP Food Bank and sponsored by the Phillipsburg Garden Club, Girl Scouts, Boy Scouts, and New Jersey Youth Corp of Phillipsburg NORWESCAP Food Bank.

10. “Green Kids” Youth Program’s new butterfly garden in the Village Community Park on N. Maple Avenue in Ridgewood received a grant of $500.00. The site is 880 square feet with 1,000 people visiting during the year and emphasis on third graders as part of their “community curriculum”. Sponsored by Women Gardeners of Ridgewood Garden Club, Bergen County Extension Service/Master Gardeners Program, Ridgewood Parks and Recreation and Boy Scouts.
11. Ridgewood Native Garden within a new village park located off Hillcrest Road in Ridgewood received $500.00 and was developed around a trail installed by an Eagle Scout. Visitors in this 15,000 square foot park numbered 100-150 per day and sponsors include the Women Gardeners of Ridgewood Garden Club, Scout troops, and Ridgewood Parks and Recreation.
12. Ridgewood Library’s public garden received a grant of $500.00 for improvement and renovation of their beds offering garden education for local residents, students and library patrons. Volunteers number 25-30 in a 75 square foot area with two large plots and three small plots and 30,000+ visitors per year. This project is sponsored by the Women Gardeners of Ridgewood.
13. Historic Van Neste Park in Ridgewood received a grant award of $500.00 for their raised beds garden. These seven huge raised beds are showcased in the center of Ridgewood’s commercial, historic district, but town budget restraints have left them devoid of perennials and annuals. The Women Gardeners of Ridgewood Garden Club has taken responsibility for planting and maintaining the site and this grant enabled them to bring these beds back to their former glory.
14. The Renovation of the Organic Garden at the Northern Valley High School in Demarest, NJ, received a grant award of $1,000.00 for a student run 3,180 square foot garden at the local public high school with 15 garden plots and 130 users providing garden education of school students in growing and appreciating fresh-grown produce. This project is sponsored by Demarest Garden Club and Northern Valley High School.
15. A Garden Education Program entitled “Celebrate Jersey Fresh and Jersey Grown” held on April 25, 2013 received a grant award of $400.00 and featured the Executive Chef from Somerset Medical Center, Peter Pascale, introducing 3 “Jersey Fresh” menus to attendees and Dominick Mondi, Executive Director of the NJNLA giving the “Jersey Grown” segment of the program. There were 180 guests and this was a joint project of the Neshanic Garden Club and the Duke Farms Foundation.
16. Karen Nash Butterfly Garden received a grant award of $1,000.00 for their garden irrigation and garden tools at their award winning community garden with countless partnering organizations including Warren Garden Club, Washington Borough School students, Memorial School students, Warren Hills Middle School & High School Service clubs, NJ Youth Corp., Scout troops, North American Butterfly Association, Donaldson’s Farms and Greenhouses, Three Brothers Nursery, The Plant Farm, ANJEE Alliance for NJ Environmental Education and others supporting this 11,000 square foot public garden

located in front of Memorial Elementary School with 525 gardening volunteers and 1200 visitors per year.

17. The Edith Duff Gwen Gardens in the Borough of Barnegat Light received a grant award of $1,000.00 for the improvement and repair of damage done by super storm Sandy. Monies went towards purchasing plants, tools and irrigation. This garden provides ongoing education of school and youth groups and is sponsored and maintained by the Garden Club of Long Beach Island with the Historical Society maintaining the Barnegat Light Museum.
18. The Raritan Township Community Garden received a grant of $1,000.00 for irrigation equipment and compost bins for their 32 plot community garden shared by the public and students at Robert Hunter Elementary School which is adjacent to the site. This project is sponsored by Neshanic Garden Club, Raritan Township Committee and Raritan Township Environmental Commission.
19. MapleFood Garden and Youth Garden Program received $1,000.00 for their community garden containing 10 raised beds with 115 users. Monies funded a storage bin, garden seeds and tools. This garden produced over 1,000 pounds of fresh produce for local food pantries and is sponsored by the Maplewood Garden Club.
20. Branchburg Board of Education received a grant award of $1,000.00 for their "Seeds to Salad" Project at Whiton Elementary School. Nine 3rd grade classes were involved in growing, maintaining and harvesting vegetables. Each class was assigned two 4' x 8' plots in a 50' x 25' garden. The project was sponsored by the Neshanic Garden Club and Master Gardeners of Somerset & Hunterdon Counties.
21. Tiger Patch Learning Garden by GoSprouts received a grant award of $1,000.00 for their community garden devoted to teaching gardening to youth and special needs persons in a 1551 square foot garden on school property in Atlantic Highlands. Budget items included plants, seeds, bulbs, gardening books and tools and the project was sponsored by Navesink Garden Club.
22. Frenchtown Community Garden received a grant award of $1,000.00 for their community garden of 22 plots with expenditures devoted to the erection of 13 raised beds reducing the risk of damage from flooding from the Delaware River. Project partners include GCNJ District IV, Frenchtown Borough Council, Frenchtown Lyons Club, Frenchtown Fire Department, Frenchtown Public Works and the Frenchtown Green Team.
23. A new Butterfly Garden in Shadowlawn Pocket Park, a Blue Star Memorial site, received a grant award of $1,000.00. Horrific damage done by super storm Sandy turned this shady park into a sunny location allowing Rake and Hoe Youth Gardeners, Girl Scouts and adult volunteers planned and implemented a butterfly garden with the purchase of "Jersey Grown" shrubs, a small tree, perennials, seeds, irrigation and signage. This project was sponsored by Rake & Hoe Garden Club of Westfield.

24. Roving Nature Center received a grant amount of $850.00 towards their Children's Garden Quilt Program and Garden Education sponsored by the Garden Club of Hunterdon Hills and run by the Roving Nature Center. Besides a Garden Education Day, this project included a vegetable garden providing garden education to preschoolers, scout groups, and summer day campers while providing food for local food banks. Expenditures included repairing deer fencing damaged by super storm Sandy, purchasing plant material and Garden Day supplies.
25. Reeves-Reed Arboretum received a grant award of $1,000.00 for their new Children's Veggie Garden at Reeves-Reed Arboretum. The benefits included encouraging fresh food choices, interest in nature and the environment and users and participants included over 3,000 children and adult volunteers. Project partners include the Garden Club of Westfield, Reeves-Reed Arboretum and the Borough of Summit.
26. Freehold Community Garden received a grant award of $1,000.00 for their community garden sponsored by the Shrewsbury Garden Club and Rutgers Master Gardeners of Monmouth County and Neighborhood Pride. This community garden is 80' x 90', has 31 plots, and 40 users. Monies purchased irrigation equipment.
27. Keyport Garden Walk received a grant award of $1,000.00 for their Garden Education weekend extravaganza including training and education in horticulture with 100 volunteers inspiring visitors to improve home landscapes with native plants, install rain gardens, plant vegetable gardens and hosted garden tours, seminars and demonstrations to 2,000+ visitors. Partners included the Keyport Garden Club, local/national businesses and Keyport Borough.

Six more grants were awarded on March 4, 2013

28. Morris County Parks received a grant award of $900.00 for their project entitled "Strengthening Food Security with a More Secure Community Garden". Project sponsored by Chester Garden Club partnering with Rutgers Cooperative Extension of Morris County and the Interfaith Food Pantry. This garden donated 1310 pounds of fresh produce to the Interfaith Food Pantry. The funds provided a simple system of fencing run on solar power to foil garden marauders. This community garden is 45,000 sq. with 113 plots that are 10' x 20' with 113 users, and is situated at Frelinghuysen Arboretum.
29. Demarest/Davies Arboretum received a grant award of $920.00 for their project: Restoration of Public Gardens damaged by super storm Sandy. The grounds of this arboretum were restored making them safe for the public once again. "Think Green, Eat Green", a public workshop was held on June 2, 2012 teaching 50 participants how to learn container vegetable gardening and was sponsored by the Demarest Garden Club and DGC Davies Arboretum Committee, and the Garden Club of New Jersey.
30. Hillsborough Presbyterian Community Garden is a new community garden that received a grant of $1,000.00 and is sponsored by the Neshanic Garden Club, Master Gardeners of

Somerset County and the Hillsborough Presbyterian Church. The HPCG provided a place for high density housing residents to garden and grow fresh produce to users and Hillsborough Social Services food bank. The garden size is 4,500' sq. with 28 plots and 28 users. Budget items included irrigation equipment, garden soil and fencing.

31. Haddon Township Community Garden received a grant of $1,000.00 for their new garden sponsored by Haddonfield Garden Club and Haddon Township. The garden is located on Collings Avenue and is 4,000 sq. with 19 plots and 30 users. Funds provided needed soil testing, and materials for raised beds and garden soil. Water was donated by the township.
32. Morris County Parks received a grant award of $1,000.00 for the restoration of the Hammond Wildflower Trail at Tourne County Park and was sponsored by the Rockaway Valley Garden Club partnering with Morris County Park Commission and The Friends of the Frelinghuysen Arboretum. The Trail contains 5 diverse habitats within its 4 acre enclosure and the grant helped restore native plants and replaced damaged fencing due to super storm Sandy.
33. The Youth Community Garden at Triple C Ranch, Terra Nova Garden Club's G-arden Unit, a teen youth group, received a grant award of $1,000.00 for their ongoing award winning community garden growing fruits and vegetables donated to the local food bank in a 2800'sq.ft. garden with 4 plots @ 450 sq. This garden project was the recipient of National Garden Clubs, Inc. Beautify Blight Award and is assisted by the Edison Wetlands Association. Expenses included deer fencing replacement, plants and seeds.

Grants Awarded on April 29, 2013

34. Campfield Community Garden received a grant award of $1,000.00 for the improvement and expansion of Florham Park's public garden located in the center of town. Funds provided native plants, trees and shrubs providing an oasis in the Florham Park shopping district. Project sponsors include the Florham Park Garden Club and the Borough of Florham Park.
35. Katzell Grove Project in the Lewis Barton Arboretum at Medford Leas in Medford, NJ received a grant award of $1,000.00 for their implementation of a native ground cover using "Jersey Grown" plant material. Project sponsors include Pinelands Garden Club and the Lewis Barton Arboretum.

36. Rahway Historical Society Garden, a new public garden, received a grant award of $500.00, a joint partnership of Rahway Garden Club, Rahway Historical Society and Rutgers Master Gardeners of Union County. Project provided education and beautification while providing funds for a water system, and soil amendments at the Historical Society's location: 1632 St. Georges Ave., Rahway, NJ.
37. Secaucus Community Garden, a new community garden, received a grant award of $1,000.00 in order to purchase a sustainable drip irrigation system, bushes, and tools. Project was sponsored by the Rutherford Garden Club, Wrap 4 a Smile, Master Gardeners of Bergen County and Secaucus Borough. Twelve beds were planted in a setting of 3,840' sq. by 16 volunteers.
38. "Honoring the Brave: A Memorial for Soldiers Past & Present" received a grant award of $300.00 providing a serene place for soldiers and community members to reflect and relax. Monies provided trees, pots, soil, and mulch, grass seed, plants and protective mesh stakes and the project was sponsored by Girl Scout Troop 40056, the Garden Club of Westfield, Westfield Armory, and Save-A-Tree.
39. "Sensory Garden" Project at the Westfield Cooperative Nursery School in Westfield, NJ, was awarded a grant amount of $356.00 for 4 raised beds and garden in a 240 sq. area to provide preschoolers with a "hands on" component to their nutrition education program, teaching them how plants grow and how to care for them. Items purchased included plants, raised bed materials, soil, plant markers, and mulch. This was a joint project of Girl Scout Troop 40056, the Garden Club of Westfield, Bartell Family Center, Amber Perennial Farm and Master Gardeners of Union Twp.
40. "Expansion and Restoration of Rancocas Nature Center Gardens" was awarded a grant in the amount of $1,000.00. The project included restoration of the children's vegetable garden and the pollinator garden and items purchased included landscape fabric, manure, top soil, mulch, flowers, shrubs, signage, and cedar raised beds. Sponsors included Mount Holly Garden Club and Burlington County Master Gardeners.
41. Bergen Point Community Garden received a grant award of $1,000.00 to purchase raised garden materials, peat moss, vegetables, garden soil, netting and mulch. Garden is located at 141 Broadway, Bayonne and is 28 sq. with 30 users with produce providing nutrition to the HIGHWAYS Food Pantry. Sponsors include GCNJ District II, The Windmill Alliance, HIGHWAYS Food Pantry, Trinity Parish in Bergen Point and GWFC Peninsula Women's Club.

Grants Awarded on June 17, 2013

42. Project Grow, Boys & Girls Club of Vineland, NJ, received a grant award of $1,000.00 for their community garden with 14 plots, 30' x 100' planted. Funds provided plants, mulch, and tools with over 25 families benefitting from the produce. Project partners included Countryside Garden Club of Millville, Master Gardeners, the Huff Family, Foster Grandparent Program, Espoma and The Garden Club of New Jersey.

43. “Seeds for Salad” Project at the Center School, 580 Old York Rd., Branchburg Twp. received $1,000.00 for their new gardening project involving special needs students. Six plots were planted with 5 volunteers and sponsors included the Neshanic Garden Club and Master Gardeners of Somerset/Hunterdon Counties. Supplies purchased included, soil, plants and tools.
44. GCNJ Standard Flower Show, “From Sea to Shining Sea” featuring a Community Garden at the New Jersey Flower and Garden Show received a grant award of $500.00. The project is a garden education event that will be held on February 13th-February 16th, 2014 at the NJ Convention Center in Edison, NJ. The partners include the Garden Club of New Jersey, Rutgers Gardens, and Mac Events. A garden will be erected by Rutgers students under the direction of Bruce Crawford, Director of Rutgers Gardens, signage, handouts, and pollinator nesting materials will be featured.
45. 2013 Jersey Fresh/Square Foot Gardening Youth Initiative received a grant award of $500.00. Project was held at the Rahway Branch of YMCA and was a summer camp program teaching square foot gardening methods. Items purchased included seeds, seedlings, garden supplies, Great Zucchini Race education day materials and a video of the day’s events. Project partners included Rahway Branch YMCA, Rahway Garden Club and the Garden Club of New Jersey.
46. Hopatcong Community Garden received a grant award of $350.00 for improvement of their garden damaged by super storm Sandy. Items purchased included tools, plants, irrigation equipment, soil and mulch. Project partners included Central Sussex Garden Club, and Hopatcong Girl and Boy Scout Troops. The garden contains 47 plots in a 6,700 square foot area.
47. Garden Education Day partnering with the Plant Farm in Broadway, NJ and Garden Clean up and garden planting project at Merrill Creek Reservoir Visitors Center’s Butterfly and Hummingbird Garden received a grant award of $350.00. Items purchased were plants and garden books for kids. Sponsors included Warren Garden Club, and Memorial School.
48. Sea Bright Dune Restoration/Rebuilding Project received a grant of $500.00 to help replant the dunes with native grasses that were destroyed by super storm Sandy. Project partners include the Garden Club of Fair Haven, Sea Bright Borough, Clean Ocean, Surfer’s Environmental Association and the Garden Club of New Jersey.
49. Sea Bright Beautification Project received a grant award of $200.00 to help in the rebuilding and restoration of downtown Sea Bright’s public gardens damaged by super storm Sandy. Monies funded the purchase of soil, shrubs and plants. Sponsors included the Garden Club of Fair Haven, Shrewsbury Garden Club and Navesink Garden Club.

Grant Awarded on October 7th, 2013

50. GCNJ Butterflies & BeeGAP (Gardeners Adding Pollinators) Project received a grant award of $573.00 to be used for materials such as nesting houses, signage, pamphlets and

materials for speakers to provide garden education to the public on the need to grow our pollinator population.

- Twelve New Community Gardens were created in 2013 from the above grant recipient list.
- Eleven Youth Programs received grants for their gardens and received garden education.
- Five public schools received grants for their gardening programs.
- Ten community/public gardens received grants to help the recovery efforts from super storm Sandy damage.
- Fourteen food banks were recipients of produce from community gardens grants recipients.

Education and Speaker Achievements

The following are Garden Education Events numbered from the grant recipients listed above:

- "Celebrate Jersey Fresh and Jersey Grown" held at Dukes Farm Orientation Center on April 25, 2013 featuring "Jersey Fresh" and "Jersey Grown" speakers as outlined in above #15.
- Garden Education Day run by the Roving Nature Center as part of the grant outlined n above #24 on May 9, 2013.
- Keyport Garden Walk's Garden Education weekend extravaganza on June 8th & 9th, 2013 as outlined in grant recipient #27 as outlined above.
- Demarest/Davies Arboretum held a "Think Green, Eat Green" public workshop on June 2, 2013 as outlined above, #29.
- Garden Education Day(s) with Memorial School's Garden Club partnering with the Plant Creek Farm and the Merrill Creek Butterfly/Hummingbird Garden at Merrill Creek Visitor's Center in Harmony, NJ as outlined in grant #47.
- 2013 Jersey Fresh/Square Foot Gardening Youth Initiative's Great Zucchini Day Race as outlined in grant award #45.
- GCNJ Butterflies & BeeGAP (Gardeners Adding Pollinators) Project with BeeGAP speaker, Jeannie Geremia, at events including "Districts in the Gardens" on September 4, 2013, Judges Council at Holly House on October 7, 2013, Navesink Garden Club on October 15, 2013, Rockaway Valley Garden Club's program on October 22nd, 2013, and Neshanic Garden Club's program on January 23, 2014. Future speaking engagements include: March 10th for Seaweeder's Garden Club, March 19th, 2014 at District I's Spring meeting, March 22nd, 2014, an Educational Exhibit at the Bridgewater Library, Point Pleasant Garden Club on April 1st, District VIII's program on April 14th, 2014, South

Amboy Public Library on May 6th, 2014, and Educational Exhibit at the GCNJ Annual Meeting on June 5th, 2014 as outlined in grant #50.

- GCNJ State Standard Flower Show at the NJ Convention Center as part of the NJ Flower and Garden Show, Educational Exhibit and public interaction from February 13th-16th, 2014 with "Pollinator Friendly" Community Gardens and Gardeners Adding Pollinators exhibit as outlined in grant #44.

Beneficiaries:

The Garden Club of New Jersey and member clubs:
The Garden Club of New Jersey Community Gardens/Jersey Fresh/Jersey Grown Project Committee has spent over $3,000.00 plus $29,000.00 worth of trees, plants, shrubs, garden tools, and seeds donated to us to disperse to our worthy grant recipients over and above the $40,000.00

These grants were deeply appreciated and utilized in community and public gardens throughout New Jersey with municipalities, schools, food pantries, youth and other groups as outlined above, and New Jersey's nurserymen, growers, farmers, garden center proprietors, the New Jersey Department of Agriculture and the citizens of New Jersey.

Municipalities directly benefitting from the grants include:

1. City of Jersey City
2. Borough of Red Bank
3. Borough of Long Valley
4. Borough of Morris Plains
5. Borough of Chatham
6. Borough of Bridgeton
7. Borough of Montclair
8. Borough of Rutherford
9. Borough of Phillipsburg
10. Borough of Ridgewood
11. Borough of Demarest
12. Hillsborough Township
13. Branchburg Township
14. Montgomery Township
15. Warren Township
16. Borough of Barnegat Light
17. Raritan Township
18. Borough of Maplewood
19. Borough of Atlantic Highlands
20. Borough of Frenchtown
21. Borough of Westfield
22. Tewksbury Township
23. Borough of Summit

24. Borough of Freehold
25. Borough of Keyport
26. Morris County
27. Haddon Township
28. Borough of Edison
29. Borough of Florham Park
30. Borough of Medford
31. Borough of Rahway
32. Borough of Secaucus
33. Rancocas State Park
34. Borough of Bayonne
35. Borough of Hopatcong
36. Borough of Vineland
37. Borough of Sea Bright
38. Borough of East Brunswick
39. Borough of Bayhead & Mantoloking
40. Borough of Bridgewater
41. Borough of Point Pleasant
42. Borough of South Amboy
43. Borough of Washington

Food Pantries receiving assistance include local pantries in above referenced municipalities.

Schools and Youth Groups benefitting from the grants include:

1. Morris Plains Elementary School
2. "Green Kids" Youth Program in Ridgewood
3. Rutherford Green Team's Community Teaching Garden-Education
4. Northern Valley High School in Demarest
5. Memorial School in Washington Borough
6. MapleFood Garden and Youth Garden Project
7. Whiton Elementary School
8. Tiger Patch Learning Garden by GoSprouts
9. Rake and Hoe Youth Gardeners
10. Roving Nature Center Children's Garden Quilt Program
11. Reeves-Reed Arboretum Children's Veggie Garden
12. Youth Community Garden at Triple C Ranch with G-arden Youth Garden Club
13. Girl Scout Troop 40056 "Sensory Garden" Project at the Westfield Cooperative Nursery School
14. Children's Vegetable & Pollinator Garden at Rancocas Nature Center Gardens
15. Project Grow, Boys & Girls Club of Vineland, NJ
16. "Seeds for Salad" Project at the Center School for Special Needs Students in Branchburg
17. Gardening Youth Initiative at YMCA Summer Camp
18. GCNJ Butterflies & BeeGAP Project involving Elementary School Children Grades 3-6.
19. Washington Avenue School in Chatham

Organizations Benefitting and Partnering with the GCNJ include:

1. United Way
2. Jersey City Landmarks Conservancy
3. Village Neighborhood Assoc. of Jersey City
4. Red Bank Environmental Commission
5. Washington Township Green Team
6. Boy Scouts of America
7. Girl Scouts of America
8. New Jersey 4H
9. Rutgers Extension Master Gardeners
10. PSE&G
11. Kiwanis
12. HOMECORP
13. Montclair Health Dept.
14. Montclair State University
15. TerraNoble Design
16. New Jersey Youth Corp of Phillipsburg
17. Ridgewood Parks and Recreation
18. Duke Farms
19. North American Butterfly Association
20. Long Beach Island Historical Society
21. Raritan Township Environmental Commission
22. Branchburg Board of Education
23. Frenchtown Borough Council
24. Frenchtown Lyons Club
25. Frenchtown Fire Company
26. Frenchtown Green Team
27. Morris County Parks System
28. Frelinghuysen Arboretum
29. Reeves-Reed Arboretum
30. Demarest Davies Arboretum
31. Hillsborough Presbyterian Church
32. Edison Wetlands Association
33. Lewis Barton Arboretum
34. Rahway Historical Society
35. Wrap 4 A Smile
36. Westfield Armory
37. Save-A-Tree
38. The Windmill Alliance

39. Trinity Parish in Bergen Point
40. Espoma
41. Foster Grandparent Program of Vineland
42. Clean Ocean
43. Surfer's Environmental Association

Nurserymen, Farmers, Growers, Garden Center Proprietors benefitting from the grants include:

1. Hionis Greenhouses
2. Donaldson's Farms
3. Morris County Farms
4. Bruce Crawford, Director Rutgers Gardens
5. Williams Nursery
6. Pinelands Nursery
7. Gardener's Supply Company
8. Home Depot
9. Lowe's
10. Wal-Mart
11. Garden Gate Nursery
12. Duke Farms
13. Staples
14. Raritan Valley Printing Co.
15. Metro Plant & Flower Exchange
16. Eiseles Nursery and Garden Center
17. Victoria's Nursery
18. Rohsler's Allendale Nursery & Florist
19. Cedar Creek Nursery
20. Benners Gardens
21. Henry Leuthardt Nurseries, Inc.
22. Costco
23. D'Angelo Farms
24. International Bulb Co.
25. Garoppo's Stone & Garden Center
26. South Jersey Landscape Supply
27. Fedco Seeds
28. Seed Savers Exchange
29. Essene Market
30. Ken's Tree Savers
31. Uplink2ink
32. Coastal Native Plants
33. Church's Garden Center & Farms, Inc.

34. Valley Brook Nursery
35. Johnny's Selected Seeds
36. Mater's Nursery
37. Aquabarrel
38. Mendham Garden Center
39. Heacock Lumber
40. Vincentown Florist
41. Timothy's Center for Gardening
42. Paw Ever last Label Company
43. Pinelands Nursery & Supply
44. McGinley's Florist & Garden Center
45. The Perennial Garden
46. Lighthouse Landscape
47. Pope's Gardens
48. Hawkin Tree Service, Inc.
49. Baker Creek Heirloom Seeds
50. Windmill Acres Farm
51. Trader Joe's
52. Bartell Farm & Garden Supplies
53. National Arbor Day Foundation
54. Amberg Perennial Farm
55. Parker Gardens
56. Spring Hill Nurseries
57. Tractor Supply
58. Russell Gardens
59. Dearborn Markets
60. Rutgers Nursery
61. Hunterdon Land Trust Farmers Market
62. Stockton Farmers Market
63. Kingwood Gardens
64. Four Seasons Greenery
65. Pleasant Run Nursery
66. Sweet Valley Farms
67. Colonial Nursery

The Garden Club of New Jersey Community Gardens/Jersey Fresh/Jersey Grown Project committee continued the goal of awarding grants to a wide range of deserving community oriented garden projects throughout New Jersey. In addition to the USDA SCBG funds this project has also awarded another $19,000.00 in plants, trees, shrubs, seeds, garden tools, posters, pamphlets and accompanying materials donated by NJ

Plants Trade Show, New Jersey Nursery and Landscape Association, Gardener's Supply Company.

This project featured a total of 4,902 participants and enjoyed more than 34,530 visitors to the project sites.

The project manager, Mrs. Geremia, authored no fewer than thirty-two articles and editorials about the benefits of the Specialty Crop Block Grant program. In the beginning Jeannie Geremia, the project coordinator, was a stalwart supporter of the Specialty Crop Block Grant program before she withdraw from the program in frustration due program management at USDA.

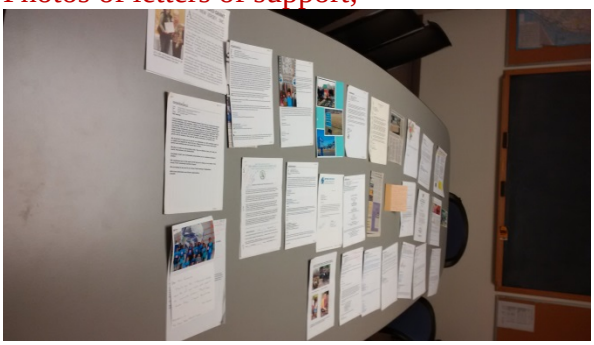
Below is a photo of the thirty-two (32) publications featuring news stories about this Specialty Crop Block Grant project and below the picture is a link to three of the articles.

https://issuu.com/gardenernews/docs/gardenernews_nov_2013
Page 16

https://issuu.com/gardenernews/docs/gardener_news
Page 25

https://issuu.com/gardenernews/docs/gn_jan_2013
Page 1

Photos of letters of support;



Here is one letter from the selection above. This letter is from the Karen Nash Memorial Butterfly Garden who received support for their garden irrigation and garden tools.

Most of the fruit and vegetable gardening plots were raised for the private consumption of the 4,902 individual project participants and therefore we do not have any fresh produce consumption data.

Lessons Learned:

USDA/AMS's rejection of properly submitted reports creates substantial additional work for program participants.

The USDA/AMS/SCBG program instructions were followed by the Garden Club at every turn and the result was three years of conflicting stories from USDA and requests for reports only to reject the reports and demand that previously rejected reports be re-submitted.

The continued rejection of properly submitted reports highlights the fact that the USDA was requiring Final Reports instead of Interim Reports. There is no justification in the regulations citing that Final Reports are due sooner than the required 90 days following the end of the grant period. Despite repeated requests, spanning several years, for relief from this practice the USDA/AMS/SCBG program continued to demand Final Reports when sub-grantees deemed Interim Reports more accurate.

The imposition of these regulations against the Garden Club of New Jersey is most unfortunate because the impact of this project had been heartening as it is the best project the Garden Club of New Jersey has initiated since the great Blue Star Memorial Project that began in New Jersey in 1944 and is now a National Garden Clubs, Inc. Project.

The garden Clubs 120 garden clubs and almost 5,000 members have been able to help make a huge impact on garden education and being able to put it into practice in 50 projects statewide.
One lesson learned is the value of partnering with like-minded organizations and we will continue to do so as we continue our goals of garden education throughout New Jersey.

Due to the SCBG management, in spite of the outstanding success of this project, the Garden Club of America requested relief from further participation in the program because of the excessive and bewildering administrative paperwork. After several years of successful projects the Garden Club of New Jersey is no longer interested in participating in the Specialty Crop Block Grant program.

The Garden Club of New Jersey went from being one of the greatest SCBG program successes to withdrawing from the SCBG due to the excessive administrative burden placed by USDA/AMS/SCBG upon grant recipients.

Contact Persons:

Submitted By:
Jeannie Geremia
GCNJ Community Garden Chair
908-782-6091
jeannieg42@earthlink.net

Logan Brown
New Jersey Department of Agriculture
609 292-8856
Logan.brown@ag.state.nj.us

Specialty Crop Block Grant Program (SCBG)
SCBG Agreement # 12-25-B-1476

Garden State Wine Growers Association
USDA AMS Agreement Number 12-25-B-1476
Final Performance Report
December 29, 2015

PROJECT TITLE
"NJ Wine Industry Branding, Marketing, Visibility & Technology Improvement Campaign"

Project Purpose & Outline
The GSWGA supports its members with marketing strategies and technology based marketing tools that further create awareness, showcase our products and drive increased sales of NJ Wines. The GSWGA also sees as one of its responsibilities to maintain an ongoing commitment to agri-tourism and the place it has in the economic life of our state. The purpose of the project is a multi-faceted branding & awareness campaign that takes the image of NJ wines and NJ wineries to a whole new level of sophistication through a new website and mobile application for smartphones.

First, the GSWGA was to build a new, mobile friendly web site which supports use by consumers on their cell phones and tablet devices. Next, the GSWGA sought support for the design and custom programming of a free downloadable GSWGA application. Once engaged the download provides consumers with a myriad of useful hands on information about all that the NJ Wine Industry has to offer. Finally, the GSWGA produced a statewide billboard campaign that brands the NJ Wine Industry and drives consumers to visit the newly redesigned web site of the GSWGA to learn more.

This project addresses a critical need- to increase awareness of locally grown and produced wines from New Jersey vineyards and wineries. Despite having one of the most valuable wine markets in the world within its borders, the state's wine industry lags behind that of its immediate neighbors in the mid-Atlantic and northeast in terms of market share. New, sophisticated tools will provide the GSWGA opportunities to reach consumers in new ways, and communicate the message of our rebranded, refreshed NJ wine industry.

The timing for this project to be developed was perfect. Technology is rapidly increasing, and internet usage on mobile devices now exceeds that on desktop computers. The GSWGA website was badly dated and not mobile friendly. Additionally, the GSWGA had recently developed a new logo and message, and better channels to deliver this rebranded message were necessary.

PROJECT APPROACH

The GSWGA has successfully developed, produced and launched the GSWGA app, redesigned web site, and mobile web site. These comprehensive tools have received high praise from the NJ Wine industry and consumers. The GSWGA app offers consumers a myriad of resources and real time, up-to-date information, including a calendar feed of all winery events, produced both at winery properties and off site. The app also has a map page with a geographic presentation of all the state's wineries, with address, phone number, and directions available. The app has also become an integral part of the highly successful GSWGA Passport Program (previously funded under a SCBG). App users can "check in" at each winery, and share their visit to Facebook or Twitter, greatly increasing the reach and visibility of the wine industry through the patronage of our consumers. The capabilities of the GSWGA app are extensive and have launched the GSWGA into the digital platform arena. At this time, there have been in excess of 1,500 downloads of the GSWGA app since it became available in late October 2014. In addition, the GSWGA has successfully produced a mobile friendly version of the GSWGA web site (newjerseywines.com). The mobile web site platform is very user friendly and provides extensive information for all hand held devices. This important tool, launched simultaneously with the GSWGA app, has also aided the GSWGA in creating a higher awareness of the NJ wine industry. As outlined in the grant project, the GSWGA has engaged in a strategic statewide billboard campaign to support the launch of the GSWGA app and mobile friendly web site. The billboard campaign included locations on heavily trafficked interstate and expressway roads. By purchasing remnant spaces outside of peak season, the GSWGA billboard displays were left up for several extra months collectively beyond what was paid for, maximizing the value of the grant spent on this marketing.

The design work was done by IGM Creative Group and 1766 Productions. The former focused on the website; the latter published the app. During the design and production phases, the GSWGA executive director and Marketing committee Chair were in weekly consultation with these companies to guide the work to best benefit the wine industry. The results are top notch, state of the art marketing tools that are helping to spread the new message of the GSWGA.

Over 50 wineries are open throughout New Jersey, and the billboards promoting the passport app was for the benefit of all wineries who chose to opt-in to participation in the app. As of the time of the billboard appearances, 42 NJ wineries were listed in the passport. By the end of the year, over 1,000 NJ wine enthusiasts had downloaded the app. As new

wineries come online and are added to the app, they will enjoy the residual impact of this exposure.

Tangible evidence of the success of these new tools and the marketing campaign to support their usage and adoption by NJ consumers can be seen in the analytics report of website usage. Enclosed with the Final Report are two files, "Analytics 2013" & "Analytics 2015." These PDFs show website traffic for the same calendar period in 2013 and 2015. 2015 saw a 27% increase in web site visits to www.newjerseywines.com, and more excitingly, a 36% increase in unique users to the site. This dramatic increase in traffic, further bolstered by an increase in social media follows and email subscribers, coincides with the GSWGA's launch of these new technological tools in the middle of 2014.

GOALS AND OUTCOMES ACHIEVED

Through an aggressive marketing campaign including physical ads (billboards, train station platforms, bus interior and exteriors), digital, social, and email, visitation to the web site of the GSWGA increased approximately 30% from 2013 to 2015, depending on what metric is used. In the original application, gallons of wine produced was offered as a benchmark. 310,684 gallons of NJ wine were produced in 2012. The target goal was a 5% increase in 2013. The actual increase realized was 13%, as 349,922 gallons were produced in 2013. The industry had an even more significant increase in 2014, when 379,930 gallons were produced. 2015 total gallons is not available at this time, but the projection based on the first three quarters of reporting suggests another record year for the wine industry.

BENEFICIARIES

The primary beneficiary of this project were New Jersey wineries, which enjoy increasingly larger patronage from both in and out of state wine consumers. Over 50 wineries are open throughout New Jersey, and the billboards promoting the passport app was for the benefit of all wineries who chose to opt-in to participation in the app. As of the time of the billboard appearances, 42 NJ wineries were listed in the passport. By the end of the year, over 1,000 NJ wine enthusiasts had downloaded the app. As new wineries come online and are added to the app, they will enjoy the residual impact of this exposure. Other beneficiaries include grape growers throughout the state. As demand for local wine increases, so does the demand for local grapes. There are over 100 vineyards that grow grapes to support the local wine industry, and the vast majority if not all of these grapes are sold to in-state wineries. The market for locally grown grapes has never been greater. We are now at a critical juncture as an industry where we must actively encourage vineyard investment and development to keep up with the demand for an authentic, genuine bottle of New Jersey wine. The GSWGA is leading such efforts in partnership with the NJ Farm Bureau, Department of Agriculture, and Rutgers University.

Other beneficiaries include specialty crop producers such as blueberry, cranberry, blackberry, peach, and apple growers. Many NJ wineries produce wines from these non-grape

products, and the demand for these wines is increasing as well. It is difficult to know exactly how many non-grape farms were supported and in what capacity, since grape and non-grape wines are not differentiated when reporting gallons produced for excise tax purposes. 422,023 gallons of NJ wine were produced in 2015, which was not only the largest volume ever, but the largest one year increase as well. Looking through the portfolios of many New Jersey wineries, particularly those who are established in what has historically been orchard and berry growing regions, suggests that a significant amount of wine was made from non-grape sources.

Lastly, agri-tourism has many subsidiary beneficiaries, such as local restaurants and hotels, which also support and purchase from NJ farms.

LESSONS LEARNED

The GSWGA learned the importance of having a mobile-friendly, user-friendly website that is accessible on as wide an array of devices as possible. By increasing our functionality and usability for the end user, we have dramatically increased the engagement between the industry and the consumer, and every metric attests to this. Most importantly, is strong, steady increase in gallons produced, which reflects increased demand for the product.

The only unexpected challenge was related to the check-in feature on the app. Because check-ins count towards a grand prize awarded to a participant who visits each and every winery in the state, these visits need to be verified as true. Using GPS technology, which other apps such as Foursquare and Facebook do, proved unreliable. After struggling to adjust the technology, the GSWGA decided to invest $2,000 of its own additional funding to purchase Bluetooth beacons which will be placed into each tasting room in early 2016. Based on what other wine trails and tourism regions have done recently with similar models, we fully expect this to make the app fully functional.

The decision to purchase the billboard space on a remnant basis proved cost-effective and maximized value of this investment, and would be recommended to other marketing campaigns using this medium.

CONTACT PERSON

John Cifelli, Executive Director
(908) 866-6529
Johncifelli@gmail.com

<u>Middlesex County Board of Agriculture</u>
SCBG # 1476
Final Performance Report
December 10, 2015

<u>PROJECT TITLE:</u>
"Middlesex County Direct Agricultural Marketing Website"

<u>PROJECT SUMMARY:</u>
The past few years have seen dramatic changes in consumer trends. These trends have been reflected in the agricultural market place and have been largely influenced by recent economic conditions. However, there have been numerous additional contributing factors such as the increased attention to eating healthy to promote a nutritious diet to reduce obesity and other health issues, buying local and fresh direct from the agricultural produce. Possibly the most significant trend is how potential consumers find out about vendors in their local area, which is by going online. Getting information to those consumers has become the primary marketing tool of the direct marketer.

The purpose of this project is to connect Middlesex County direct marketers and growers of *specialty crops* with the consuming public through of a single website. The consuming public is often unaware of the existence of these markets or where they are located or how to access them. A user friendly website would allow the county's producers to connect with consumers in the state's third most populous county for the purpose of promoting their products, providing contact information, the benefits of buying direct, as well as providing other educational information that might help influence the consumer to buy direct.

This project potentially benefits all county producers of *specialty crops* as it provides an easy way for consumers to find local marketers using the most powerful marketing tool known to man, the internet. The project provides an additional and broader based method of acquainting

the consuming public with the producer; something we have been doing for many years through various other means.

Critical to the success of this website is the relationship with the New Jersey Farmers Direct Marketing Association (NJFDMA) and associated website visitnjfarms.org. This recently modified site has 113 individuals registered of which 82% of the registered farms sell specialty crops. The website traffic on this statewide site reached 98,450 page views in 2014, so the exposure and promotional opportunities with the addition of the Middlesex County Direct Marketing website only enhances the content provided to the consumer.

PROJECT APPROACH:

The project was a cooperative effort of Middlesex County Board of Agriculture members with Rutgers Cooperative Extension of Middlesex County, NJAES and contracted web designer. The website concept, design, and implementation process was reviewed at monthly Board of Agriculture meetings and quarterly NJFDMA meetings throughout the period of the grant. The connection with NJFDMA and their website visitnjfarmsw.org was determined important in the expansion of the website middlesexcountyfarms.com created by the web designer, Sean Convery. This Middlesex County Direct Marketing site was designed to educate consumers on specialty crops, increase web presence, and promote activities of direct marketers in Middlesex County. Specifics of the site included the following:

- Web space/hosting from Accu Webhosting (https://www.accuwebhosting.com/
- Design software Adobe Photoshop and Microsoft Expression Web
- ASP (Active Server Pages) and CSS (Cascading Style Sheets**)** for using various mobile devices
- Mssql database to house listing of farm markets, specialty crops, registration and farm visits.
- QR code system to register user visitors
- Google Analytics to collect user data

There are various options for visitors to click on as they enter the website. They include “Find a Farm”, “Videos”, “Coupons/Passport”, “History”, and “Events”. The “Find a Farm” section includes 32 local growers with addresses and contact information. There are 8 videos currently on the site discussing specialty crops, types of farming operations, and information on specialty crops and NJ Agriculture.

The website was promoted through numerous media outlets and organizations. As mentioned previously, it was very important to work closely with NJFDMA, the state direct marketing organization, to increase visibility to its members and the general public. NJFDMA with reorganization and a new website currently has over 100 members and plans to expand 4-5 times that over the next few years. The middlesexcountyfarms.com website was promoted at events and programs including the Middlesex County Fair (over 1,000 visitors to the Ag Building and Extension Booth), Master Gardener Classes (over 150 participants), and farmer workshops and meetings (over 200 participants). Surveys were completed by more than 200 Middlesex Fair

visitors as part of website promotion and their preferences with regards to direct marketers and locally grown specialty crops. It was promoted through our various media connections such as News12, NJ TV, and local newspapers.

The website has provided more opportunities for local farmers to promote specialty crops and events to bring in more customers. Linking this with the NJFDMA site was important since this organization is a statewide group that reaches beyond the borders of the county. As a small state, many of the Middlesex Farmers attract customers from many of the surrounding counties and even nearby Metropolitan areas.

A website is an invaluable promotional tool for any individual, group, organization in the 21st Century. The complexity of the site, its "bells and whistles", is an important consideration for the end user who may or may not have the same/similar technology or knowledge base to use it. As an example, the use of QR codes to qualify for coupons at some cooperating direct market locations was not well received because they wanted instant discounts or did not have phones with this App. Starting with a downloadable coupon to print would have been a better approach and expand on other options in the future.

Cooperation with Rutgers Cooperative Extension staff and selection of an experienced web designer were critical to the completion of the website. They provided the expertise to help the Board develop the site, provide materials and video for educational enhancement, network with media sources, and general outreach to other organizations and the public.

GOALS AND OUTCOMES ACHIEVED:

The project has successfully increased exposure to direct marketers within Middlesex County and the state. There are over 800,000 potential consumers in Middlesex County and over 8 million in the state of New Jersey. Cooperating with Rutgers Cooperative Extension of Middlesex County helped us exceed our expectations of outreach and promotional opportunities for direct marketed specialty crops. They advertised the site through TV (i.e. News 12 and NJ TV), radio (i.e. 101.5), newspaper (i.e. Star Ledger, Home News) and Rutgers University community.

The farmers who were initial cooperators on the project indicated it helped create awareness and promote their operations. Since there were delays in the completion of the website, we were not able to gather and compare income data of farmers as per the 20% increase target amount stated in the goal/outcome portion of the project. We hope to compile this information by next season.

There was limited participation by growers in Middlesex County, but we did work with about 5 of our higher profile direct marketers of specialty crops. Individual meetings and discussions with these growers provided the following feedback:

- QR code technology has limited use on the farm. Patience and phone space were major factors preventing its use
- Information needs to be clear and precise

- Website brings more customers to their individual farm page
- It is important to have the expertise of Extension to help develop the site and deliver information to the customer whether it is short informational videos, specialty crop descriptions, or health benefits

A Farmer Twilight meeting in August of 2015 had over 60 growers in attendance and a portion of the program was devoted to the discussion of the website and receiving feedback from them. A lengthy discussion on the coupon delivery mechanism ensued.

Since the completion of the site, there were 742 page views and 25 users that registered for the program. We expect these numbers to increase over the next season as more growers and their customers become more familiar with the site.

BENEFICIARIES:

The beneficiaries of this project are all *specialty crop* producers in the county that market directly to the public. Typical of those producers are vegetable growers, fruit growers, nurseries, Christmas tree growers and wineries. There are over 120 producers, part-time or full-time, in Middlesex County that potentially benefits from visitation to the website and associated links attached to the page. With the links to other websites, in particular, the visitnjfarms.org we projected hundreds of additional direct marketers benefitted from the site.

LESSONS LEARNED:

It was a tremendous opportunity to promote specialty crops grown throughout the county. The website project encouraged grower cooperation with regards to the collection of information on crops, sales and promotion, and farm management strategies (market location, hours, seasonal items, and so on).

It cannot be assumed that all direct marketers will have clientele that can utilize or navigate throughout the website. It is important to simplify discount acquisition, surveys, video clips and pictures, and promotional opportunities.

A few of the farmers indicated it was easier to have customers bring a coupon printed off the site than to have people swipe QR codes for future discounts. People tend to be finicky and become frustrated with the newer technology if it does not work.

Users were hesitant to install a QR program on their phones because it required significant space or it took too long.

ADDITIONAL INFORMATION:

All of the funds requested for the project were not needed to complete the website design. The web designer was very efficient with use of time and management of the site for the duration of the project. A total of $8,000 was invoiced by web designer to the Middlesex County Board of Agriculture for payment.

CONTACT PERSONS:

William Griffin, Former President
Phone: 732-991-1268
Fax: 732-398-5276
Email: wvgathome@aol.com

Rodger Jany President of the Middlesex County Board of Agriculture
Phone: 609-712-3600
Email: rjany@simonsonfarms.com

Carolyn Hauser Vice President of the Middlesex County Board of Agriculture
Phone: 732-591-1966
Email: midgie718@Verizon.net

New Jersey Agricultural Society
USDA SCBG Agreement #12-25-B-1476
Final Performance Report
December 20, 2015

PROJECT TITLE: Fresh Produce Nutrition Education Program

PROJECT SUMMARY: The Fresh Produce Nutrition Education Program educated low-income families and the general public about the nutritional value of fresh fruits and vegetables, as well as methods of preparing healthy meals using these crops. The project addressed the need of increasing knowledge on how to use fruits and vegetables, nutritional benefits, and access to fresh produce at local farms. This project is important and timely because of the issues surrounding food waste and food insecurity. With 16% of New Jersey's population experiencing food insecurity, and 26.9% obesity rate in New Jersey adults, now is the time to educate our residents how to increase use of fruits and vegetables in their diets. The project benefits specialty crop producers, particularly fruit and vegetable growers as people gain an appreciation for the taste of vegetables, the nutritional value, and the cost-savings by cooking at home.

PROJECT APPROACH:

The New Jersey Agricultural Society hired Brian Strumfels and Elyse Yerrapathruni, with NJAS Executive Director/FAH Program Director, Kristina Guttadora, providing oversight to

implement the project. Brian and Elyse executed most of the work plan of the grant, with Kristina's direction at several meetings. Kristina wrote the reports, managed the budget and oversaw the staff throughout the project. Kris also worked in seeking legal advice on the copyright laws pertaining to the recipe book.

Recipe Book and Promo Items
Brian produced a fresh produce cookbook, with a collection of recipes which were simple, budget-friendly and focused on uses of fruits and vegetables. He researched the pricing on the recipe book printing and printed the supply used for the project. Elyse created brochures and promotional magnets, which were handed out at county fairs and outreach events.

Culinary/Nutrition Workshops: The project consisted of five workshops with church groups, three follow-up workshops with the same churches, and 1 workshop to the public at a library. We added one additional workshop to the original work plan to get closer to our revised goal of reaching 150 people through the nutrition education workshops.

Brian set up the workshop schedule with recipient groups. The workshops were advertised at the churches and library and registration took place internally within the organizations. Elyse and Brian visited the churches and provided a two hour seminar including pre surveys, a power point presentation, games, culinary techniques, and taste testing. Brian purchased the produce and prepared samples of all of the food in advance and then walked the participants through the stages of each of the three selected recipes. Participants received nutrition handouts and a copy of our recipe book at the workshops. Lastly, Elyse and Brian talked with the participants about sources of fresh produce from New Jersey farms, which was highlighted in the book.

After one year, our staff arranged an assessment workshop with the same churches. We also changed the format of the "potluck" dinners to a format which reduced food safety liability. Prior to the second workshop, Brian planned and purchased fresh produce and ingredients for each of the participants to prepare a meal. They picked up their bags of ingredients a week before the workshop and the recipe instructions were provided. They were expected to prepare the recipe at home and then report to the group on their successes, challenges, etc. The second workshop enabled participants to share their success using the recipe book. Brian provided tasting samples of the dishes, and Elyse led a discussion with questions (see attached) and a game with the participants.

Distribution of Materials at Gleanings and County Fairs: The Fresh Produce Nutrition Education Program enabled us to share nutritional information at county fairs to the general public. Elyse registered Farmers Against Hunger for fairs and outreach events. We conducted outreach at fairs with the assistance of volunteer leaders. Elyse managed and trained the volunteers who assisted with this outreach. We attended the Monmouth, Mercer, and Somerset county fairs, the Haddonfield Farmers Market and handed out approximately 1500 brochures and 500 magnets which promoted our "Eat the Rainbow. Feed the Rainbow" theme.

The project focused benefitted specialty crop producers only, by focusing the curriculum entirely on fruits and vegetables and not other products such as meats, dairy, etc.

Significant Contributions and Role of Project Partners
We worked with the Mt. Calvary Baptist Church of Camden, Mt. Olivet Baptist Church of Hightstown, New Holy Cross Church of Trenton, Second Baptist Church of Mt. Holly, Sunset Road Church of Christ (Willingboro) and East Brunswick Library to conduct our nutrition education program. The role of these partners was to provide an approved kitchen facility and workshop space for the program, advertise the program to congregation members and manage registration for the events.

GOALS AND OUTCOMES ACHIEVED:
The activities that were completed to reach our performance goals were: nutrition power point presentations, interactive discussions, taste testings, recipe sharing, and handouts. The program enabled our organization to hand out over 1500 brochures, and 500 magnets to the general public and reach 127 low-income families through our formal nutrition education workshops. Elyse and Brian conducted the pre and post surveys with the low-income groups who participated in the culinary/nutrition education program. We faced a challenge at some locations to have the same participants return for the second workshop, due to the inconsistent nature of the families in some of these communities, and therefore did not meet our original level of achievement. Our original goal was 200 families, followed by a revision of 150. Several of our workshops had many people registered, and then only a handful came. Fortunately, those that did participate made significant changes in their consumption and comfort of using fresh produce in meals, and we expect that a change in target audience to school children, may provide more consistency in the future.

Our pre-surveys compiled baseline data on:
1) consumption of fruits and vegetables 2) access and price of fruits and vegetables 3) reasons for purchasing fruits (health, nutrition, taste, traditions), 4) knowledge of dietary recommendations and variety 5) cooking within the home – frequency and comfort level.

Our post-surveys measured:

1) increases in consumption 2) increases in culinary knowledge 3) increases in nutritional knowledge

Major Successful Outcomes

<u>Inclusion of Fresh Fruits and Vegetables in their diets:</u>
Using the pre-survey, we established that only 43% of the population surveyed includes a fresh fruit or vegetable in their daily diet. The post-survey indicated that 55% included fruits and vegetables at more than one meal and 30% included fruits and vegetables in at least one meal.

<u>Nutritional Knowledge:</u>
Using the pre-survey, we established that only 24% of the participants surveyed identified that they have a strong base knowledge of fruit and vegetable nutrition. At the conclusion of the project, 52% of participants identified that they consider nutrition when making food purchases.

Culinary Knowledge:
Using the pre-survey, we established that only 40% of the population cooks daily at home. At the conclusion of the project, 69% of participants identified that they feel more comfortable cooking with fruits and vegetables as a result of the project.

Accomplishments
We feel that this project enabled us to create the bones of a program that can now be built upon. The recipe book, brochures and handouts we created as a result of this project are tools we can use to continue to educate low-income families and the general public for many years to come. The brochures could be available to specialty crop producers to use in their markets and the recipe books could continue to be sold as program income to continue the program beyond the grant period. We will use the handouts with our gleaning groups, emergency food agencies, with the teachers in our "sister" Ag in the Classroom - Learning Through Gardening program, and at outreach events in the future. The investment of time spent creating these will enable us to continue expanding on this outreach.

BENEFICIARIES
The farmers whose businesses were listed in the recipe book benefitted from the project through advertising of their farms at workshops and in the book. We highlighted 50 farms that participate in the Farmers Against Hunger program. We reached 127 people through the nutrition education program and at least 1500 people received handouts at the county fairs.

LESSONS LEARNED

Recipe Book: We recommend that groups who may want to create a similar recipe book be aware that it be reviewed by an attorney to insure compliance with copyright law. We were able to do so free of charge through the Pro Bono Partnership and were advised on the proper procedures for scripting recipes for use. This delayed our project, but enabled us to make sure that we were in compliance. We have received great feedback on our recipe book, in that it provides healthy, budget-friendly recipes.

Audience: We also recommend a younger audience for this project. 75% of our population was over 50. We found that those who registered for our workshops were mostly seniors, rather than the younger children and parents we had hoped to target. We recommend doing workshops in school or youth programs in the future to have larger audiences and audiences who may benefit more from the program.

Workshop Schedule: Our workshops became more spread out than we had hoped for originally. Rather than a six month time period between the original workshops and assessment workshops, we had about one year in between. We recommend a series of workshops over a six week period rather than just two workshops, so spread apart. We also learned that registering participants in

advance, does not mean that they will show up. It may be better to do more “one-time” demonstrations, or gear the program to an audience such as a youth group, seniors group, or others where they will be more likely to be “on-site” regularly at a given time. This would have helped us reach our outcome.

Expansion: This project could be expanded by including taste testing at farm markets and where the farmers are selling their products. We found that people really enjoyed the tastings, which would help them consider trying vegetables in a new way. By providing these workshops on site at farms or markets, customers would have a direct link to purchasing the vegetable.

Conclusions
In conclusion, we feel that the project was beneficial to the specialty crop growers because it enabled the low-income and general public to become more aware of simple, budget-friendly recipes to use the crops they produce. People were very receptive to the recipes and handouts.

Partners in this Project
We partnered with Mt. Calvary Baptist Church (Camden, NJ), Second Baptist Church (Mt. Holly), Mt. Olivet (Hightstown), Sunset Road Church of Christ (Willingboro).

We also conducted a one-time workshop at the East Brunswick Public Library for a group of 14 participants.

CONTACT PERSON:
Kristina Guttadora
1200 Florence Columbus Road
Bordentown, NJ 08505

ADDITIONAL INFORMATION:
Please see attached photos, brochure, recipe book and handouts.

WORKSHOP PHOTOS

Local Sources of Fresh Produce

Burlington County
Bordentown
Chesterfield
Columbus
Delran
Medford (Kirby's)
Moorestown (Burlington County)

Camden County
Berlin
Blackwood
*Camden, AHEC Community Farmers Market
Corner of Broadway & MLK, Jr. Blvd; (856) 963-2432 x201
Late June - October
*Camden, Our Lady of Lourdes Community Farmers Market

1600 Haddon Avenue; (856) 757-3727
Late June - October
*Camden, Virtua Health Farmers Market
1000 Atlantic Avenue; (856) 963-2432 x201
Late June - October
Collingswood
Haddon Heights
Haddonfield
Merchantville
Voorhees
Westmont

Mercer County
Hightstown
Hopewell
Pennington
Princeton
Robbinsville
Trenton (Capital City)
Trenton (Spruce Street)
West Windsor

Produce Junction Stores
Clementon, Blackwood-Clementon & Chews Landing Roads
Magnolia, 523 White Horse Pike
Maple Shade, 14 Willow Road
Marlton, 85 East Route 70
Willingboro, 320 Beverly Rancocas Road

***Information provided by: Jersey Fresh, NJ Department of Agriculture**

Easy Eats!

Fruit & Vegetable WORKSHOP #2
Thursday, June 18 at 12:00 PM

Welcome to the start of the Easy Eats! Fruit & Vegetable Workshop #2!

Here is a recipe from our cookbook, *Cooking New Jersey Produce with Farmers Against Hunger*, and the ingredients you will need to try this recipe at home this week. Please enjoy the meal with your family and friends at home. As you prepare, cook, serve and eat your meal,

please think about the questions below. You do not have to write down or submit any answers; we will just use these questions to lead our discussion at Workshop #2.

1. How easy or difficult did you find this recipe? What factors made this recipe easier or more difficult than others you have tried?

2. Did you think the recipe preparation and cooking times were reasonable? Or did you find the recipe too time-consuming?

3. Did you encounter any obstacles while preparing, cooking or serving your recipe?

4. Did you enjoy the flavors and textures of the meal? Why or why not?

5. Do you think the recipe had too many or not enough vegetables and/or fruits? Or was the vegetable and/or fruit content just right?

6. Would you make this recipe again? Why or why not?

7. Did you try any of the other recipes in the cookbook over the past year? Will you continue to use the cookbook?

8. Do you think the cookbook and Workshop #1 helped increase your vegetable and fruit consumption?

Vegetable & Fruit Follow-Up Workshop

Introduction – Brian (10 min)
Recipe Discussion – Elyse (10 min)
Muffins – Brian (10 min)
Games – Elyse (10 min)
Workshop Discussion – Elyse (10 min)
Serve Muffins / Summary – Both (10 min)

<u>Recipe</u> Discussion:
How many of you received a bag and were able to make a recipe in the last week? We can discuss this particular recipe or the recipes in general …

9. How easy or difficult did you find this recipe? What factors made this recipe easier or more difficult than others you have tried? Did you try any of the other recipes this year?

10. Did you think the recipe preparation and cooking times were reasonable? Or did you find the recipe too time-consuming?

11. Did you encounter any obstacles while preparing, cooking or serving your recipe?

12. Did you enjoy the flavors and textures of the meal? Why or why not?

13. Do you think the recipe had too many or not enough vegetables and/or fruits? Or was the vegetable and/or fruit content just right?

14. Would you make this recipe again? Why or why not?

15. Will you continue to use the cookbook? Why or why not?

<u>Workshop</u> Discussion:
We would like to get a better idea about the usefulness of our first workshop. Part of the grant that we received asks us to "measure" whether your knowledge, habits and attitudes changed over the course of the past year, from W#1 to W#2. The Post-Workshop Survey will help us determine the effectiveness of the workshops. Feel free to answer the questions silently or comment as we go through them together …

1. See Survey!

2. Also, do you think the cookbook helped increase your vegetable and fruit consumption over the past year?

Game:

I have a NJ Produce Crossword Puzzle for you to solve! The answers are V/F grown extensively in NJ – many are top 10 crops for NJ.

I tried not to make it too hard … aim is to have fun! But after you are finished and we go over the answers, I'll add a trivia question for each V/F. These might be a little more difficult, but there are prizes involved!

Feel free to discuss the crossword with your neighbors to see how many you can get before we begin the trivia.

I'll give you the first one … Brussels sprout

1A Brussels Sprout: In Belgium country of origin, BS typically served with:
a) Chicken b) chestnuts c) cheese
1D Blueberries: Early 1900s, blueberries only wild; 1916, 1st cultivated on a farm:
a) Michigan b) Oregon c) NJ
2D Squash: Both summer and winter squash originated in:
a) South America b) Europe c)Asia
3D Eggplant: Salting eggplant before cooking will:
a) decrease oil absorption b) decrease bitterness c) both
4D Peach: Peaches and nectarines are same species T or F
5D Cranberry: Excellent source of a) vit D b) vit C c) sodium
6D Bell Pepper: In India, Australia & New Zealand, bell peppers are called:
a) Capsicum b) sweet pepper c) lobe pepper
7A Arugula: aka
a) pepper lettuce b) bitter greens c) rocket
8A Apple: Whole apples and apple juice are both excellent sources of fiber
T or F
9A Snap peas: snow peas and snap peas are the same plant
T or F
10A Spinach: excellent source of:
a) sat fat b) vit K c) carbs
11D collards: collards are in the lettuce family
T or F
12A beets: the same pigments used for food coloring are also antioxidants
T or F
13D tomato: high antioxidant that has been shown to decrease cancer risk:
a) omega-6 fatty acids b) fiber c) Lycopene
14A carrot: wild carrots are always orange
T or F

New Jersey Beekeepers Association
USDA AMS Agreement Number # 1476
Final Performance Report
Submitted; December 31, 2014
Revised April 15, 2016

Project Title;
"Increasing overwintering survival of Honey Bee and native Pollinator populations"

Project Summary

Background

New Jersey's honey bees are experiencing overwintering deaths of 30%. This decline is not only a problem for New Jersey beekeepers involved in the pollination of crops and the production of honey, but is a problem for all of the state's agriculture since over 80% of all our fruits and vegetables must be pollinated by insects.

A primary, contributing factor to the unsustainable winter losses is a lack of consistent and varied forage in late summer and early fall to support nutritional needs, immune system support and storage of sufficient stores for winter survival. The New Jersey Beekeepers Association (NJBA) hoped to foster an understanding of the complex interaction between the carbohydrate and amino acid content of nectar which results in the raw honey food supply for the bees and to further catalyze and increase in the amount of nectar available to pollinators through a program which replants the New Jersey landscape with nectar-rich forbs.

The public needs to be educated on the importance of late-season forage for the honey bee and a market for the production of nectar-producing forbs, especially those capable of producing late summer and early fall (the time of year in New Jersey where the majority of areas suffer a severe nectar dearth) needs to be developed. This grant sought to produce educational materials and encourage the public to plant perennial, late-season nectar-producing forbs in their yards.

Working in conjunction with the New Jersey State Apiarist through a number of years of Winter Loss Surveys, and due to the densely populated nature of much of New Jersey, working toward these goals is an important step in improving the sustainability of beekeeping in New Jersey which has suffered in the last decade and continues to suffer.

Project Approach

Summary of activities performed

During 2013, the first year of the grant, committee members were identified, meeting schedules were developed and a division of labor across the members of the committee was established. Beginning in April 2013 we identified videographers and developed the criteria to evaluate them. The committee developed a PowerPoint presentation to use as a basis for the video and video clips and still photographs were solicited from the NJBA membership.

A videographer was selected in October of 2013. In parallel, a survey was developed to measure the effectiveness of the video.

At the same time, we worked on our second goal which was to begin to alleviate the lack of late-season nectar producing plants by working to reintroduce self-seeding perennial flowering plants

in the urban and suburban environments in New Jersey.
Our third goal, in the second phase of the grant, was to identify three general areas, one each in North, Central and South Jersey for test plots for the chosen perennials. By June of 2013 we had identified and entered into verbal agreements with Stockton State College in southern New Jersey, From the Garden Inc. for central New Jersey. By October 2013 we identified Ramapo College as the test plot site in northern New Jersey. We determined planting methodologies and plot size and executed agreements with Stock and Ramapo. Two seed sources were identified for the three test plots and seeds were purchased from Ernst Conservation Seeds (ECS) and Prairie Moon Nursery (PMN):

Plant	***Quantity***
Asclepsias tuberosa (Butterfly Milkweed)	***3,000***
Solidago flexicaulis (Zigzag Goldenrod)	***2,000***
Solidago sempervirens (Seaside Goldenrod)	***2,000***
Symphyotrichum novae-angliae (New England Aster)	***3,000***
Total:	***10,000***

Seed	***Quantity***
Butterfly Milkweed (ECS)	***1 pound***
New England Aster (ECS)	***1 pound***
Modified Mid-Atlantic Mixture* (ECS)	***3 pounds***
Solidago Speciosa (Showy Goldenrod) (PMN)	***1 pound***
	6 pounds

****19 native perennials including New England Aster, Butterfly Milkweed***

During the second year of the grant, 2014, the committee continued to meet approximately 13 times to further the goals of the gran. Visits were made to the two nurseries to gauge progress on the production of the plants as well as visits to the test plots at Stockton, Ramapo and From the Garden to assess the progress of the plantings throughout the season.
Filming of the video presentation was complete in the spring of 2014. The script for the voice over was completed and the video was finalized and published on the internet on July 4, 2014. Nurseries shipped plant plugs throughout the spring and early summer to the test plots and NJBA members for distribution at 11 county, farmer, 4-H and the New Jersey state fairs from July 7, 2014 through August 20, 2014. Plants were handed our free, along with the pollinator plant brochure (see Attachment A) and individual planting instruction cards for each of the three species. NJBA members at the fairs answered questions about the importance of late season forage for honey bees and other pollinators in New Jersey and provided general education during the plant giveaways.

By March, 2014 planting protocols were developed for the three test plots, each a quarter acre in size, with site preparation, planting methodologies for both seed and plugs from the nurseries, maintenance, the assignment of tasks involved and monitoring protocols, Methodologies included site evaluation taking into consideration amount of sunlight per day, soil composition, pH and nutrient levels, drainage and location in a semi-natural location.

Goals and Outcomes Achieved

To meet our first goal of increasing awareness among New Jersey residents of the complex relationship between flowering plants and pollinators we performed research on plants native to the state that would provide late season nectar sources. Our ultimate goal was to produce a video that could be published on the internet and distributed to all our members to use in presentations to educate the public.

The video is available at (**https://www.youtube.com/watch?v=WBVQGupoxEA** and **https://vimeo.com/105235755**). It has been viewed 2,365 times and shown at trade shows such as NJ Plants – Professional Landscape & Nursery Trade Show, the New Jersey Flower and Garden Show and the League of New Jersey Municipalities Annual Conference. It has also been used by NJBA to a variety of garden clubs, schools and other groups interested in helping the honey bee.

In addition to the video, we produced a tri-fold, color brochure entitle, "New Jersey's Honey Bees And Other Pollinators Need Your Help!" It was handed out with the seedlings and has become a staple at outreach events that the NJBA branches and members are involved in throughout the year. It contains a list of pollinator friendly plants as well as the link and a QR code to access the accompanying video on the internet. Unexpectedly, the Pollinator Stewardship Council, an organization with the mission to "defend managed and native pollinators" has linked their website to our video.

Despite the fact that we developed a survey to gauge the effectiveness of the video, it was apparent that the venues for the plants giveaways and viewing of the video at trade shows were not going to accommodate the benchmark of a pre-viewing and post-viewing survey. Attendees typically stroll by the booths at a fair (we had booths at 11 in the summer of 2014) or trade show, pausing to ask a few questions, pick up a brochure or watch some of the video. Since we had developed a post-viewing survey, we were able to distribute this to a number of people and collected 30 responses. Based on this extremely small sampling, the video successfully communicated to all viewers what insects and animals are pollinators, what percentage of plants require pollination and the negative environmental factors hurting honey bees. Most participants found the video to be informative, memorable, entertaining and told them a lot about pollinators. Almost no one found the video to be confusing or boring.

Favorably, the brochure continues to be in demand at outreach events, and the Association reprints it annually for distribution by the branches and members. The video is used at flower shows attended by the general public and trade shows attended by officials and employees of all the New Jersey municipalities and another for landscape professionals.

In order to meet our second goal, the committee identified native perennials that filled our requirement. A bid request was developed and sent to 10 nurseries in November of 2013. Seven nurseries responded negatively. Two of the three remaining bids were accepted to grow and provide plants for the summer of 2014 for distribution at county and state agricultural and 4-H fairs attended by NJBA member branches. The nurseries were Clemenson Farms Native Nursery

in Estell Manor, NJ and New Moon Nursery in Bridgeton, NJ with contracts signed in February of 2014.

The Committee quickly found that both the number of native plants to be produced (32,280) was not only unrealistic, but that nurseries able to produce that number of plants was very limited. In addition, seed for all the species of perennials specified in the original grant were not available. Adjustments needed to be made in the species that were ultimately selected. We were able to identify two nurseries that could meet our needs and one seed supplier. We were lucky in that we had a member who was an attorney who was able to review contracts with nurseries before we completed them. It would have been of greater concern to enter into contracts without this skill readily available to us at no cost.

As for Goal #2, in the end we were able to distribute 10,000 plants to approximately 2,500 to 3,000 members of the public in attendance at eleven 4-H, County and State Fairs though out the state of New Jersey from July 9 through August 24, 2014.

Beneficiaries

The main beneficiaries of this project's accomplishments were the beekeepers in the state of New Jersey, 1,200 of who are members of the NJBA. Using the video and the plant giveaways educated thousands of members of the general public, gardeners, master gardeners, landscapers and officials from the 565 municipalities in the state. As a result of the exposure we have been able to gain, towns have come forward interested in planting and having bees as part of their community gardens. Use of the survey tool showed that the video is capable of raising the public's awareness of the importance of honey bees, other pollinators and the nectar sources they require.

Ten thousand native, late-season nectar-producing plants were distributed to the public during the giveaway period. Since the vast majority of New Jersey beekeepers are small-scale beekeepers with only one or a few hives, and many in densely populated areas, it is hopeful that this effort will spark an interest in the average home and land owner to continue to grow these plants, although quantifying this result is beyond the scope of this grant.

Of particular importance was establishing relationships with utility companies and other stake holders. Since the conclusion of the grant at the end of 2014 we have met with utility companies and this fall completed a joint project with a utility to plant a late-season forage meadow on a Right-of-Way in Morris County, New Jersey using methodologies and seed mixes and supplier developed during the grant.

LESSONS LEARNED

Project Administration

We found that we had problems with the administration of the grant and keeping up with timelines due to lack of planning PRIOR to receiving the grant. Unfortunately, the former president of the NJBA who was responsible for applying for and obtaining this grant, passed away soon after it was awarded. We had no access to any of the planning that he did and there was no documentation or turnover available. It is recommended that any planning, research and identification of resources done prior to the submission of a grant application be adequately

documented.
Due to weather, e.g. temperatures and rainfall, during the monitoring of the three test plots, there was a concern that germination was significantly below what had been expected. More knowledge on stratification and germination rates before the plantings would have alleviated some of these concerns. Most valuable of all, was the knowledge gained from the test plots, that establishing a meadow of native, self-seeding, nectar-producing flowering plants takes more than one season.
While we have gotten very positive feedback on the video and brochure that we produced, we did not have an adequate tool in the survey the public attending fairs and viewing it, to measure the effectiveness of the video in a concrete way. The fair venues did not support either the viewing of the video or the administration of the questionnaires. While the trade show and conference venues provided the ability to screen the video, as well as hand out brochures, they were not conducive to getting people to spend the time to fill out a survey, view the eight-minute video and then fill out a second survey. Additionally, none of the committee members had any statistical analysis background, and it would have been helpful to have someone with skills in questionnaire's, surveys and analysis to help us quantify our results.
In evaluating whether the benchmark for our goal , "Verbal communication with New Jersey beekeepers reporting a common failure in the accumulation of fall honey stores which has been validated by data from hive scale measurements which are available from limited number of locations as well as the NASA hive scale network.) this was a flawed benchmark. There are not enough NJBA members with hive scales to make the data meaningful. In fact, we are aware of only one. As for the NASA hive scale network, there was only one New Jersey participant (Bill Coniglio, the original contact for this grant who is now deceased); so this does not have any data for nectar flows in New Jersey. However, we have several years of an annual winter loss survey in which we have beekeepers report on how much supplemental fall feeding is done. Therefore, we can and will monitor the "need for feeding sugar syrup to overwintering hives".
The major lesson learned was how important up front planning and documentation is. The committee utilized "GoToMeeting" an online meeting application which allowed us to have frequent meetings between committee members that lived all over the state without the need to travel. Also helpful was utilizing our website for documentation. All grant documents, contracts, meeting minutes, invoices, committee member contact information, research, MOU's, bids, research, etc. were posted on a webpage accessible to the committee members for easy reference.
An unexpected outcome of the grant was establishing relationships with utility companies and working to plant Right-of-Ways. We are hopeful this will greatly expand the reach of this project's goals beyond the grant itself.

Contact Person

Janet A. Katz
908 295-7620
president@njbeekeepers.org

SCBG Agreement # 12-25-B-1476
Final Performance Report
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New Jersey Blueberry Growers Association

PROJECT TITLE
"Spotted Wing Drosophila in New Jersey: An Urgent Need for Effective Monitoring and Management"

PROJECT SUMMARY
The New Jersey blueberry industry occupies 7,500 acres and has a value for utilized production of $62,510,000 (NASS, NJ Blueberry Statistics, 2010). The industry represents one of the most unique agricultural commodities world-wide with the majority of acreage in the US, and New Jersey ranks third in utilized production. Currently, the blueberry industry in the US is being threatened by a new invasive insect pest, the spotted wing drosophila. Spotted wing drosophila was first detected in the western US in 2008 and has since rapidly expanded its range throughout the eastern US. In New Jersey, Spotted wing drosophila was first detected in blueberry fields in late June 2011. This recent range expansion puts New Jersey blueberry farms at risk because of the potential loss of revenue from reduced fruit quality and lost sales. Little is known about the biology, ecology, and management of spotted wing drosophila, particularly in New Jersey. Therefore, it is critical to develop monitoring and management tactics for spotted wing drosophila in blueberries that are suitable for New Jersey to maintain the sustainability of this industry. Here we conducted studies to identify potential sources of infestation within blueberry farms, develop effective monitoring tools, and evaluate various insecticides with different modes of action against spotted wing drosophila.

The following insecticides were effective against spotted wing drosophila: Imidan, Malathion, Delegate, Exirel, Bifenture, Danitol, and Lannate. The unregistered insecticide IKI-3106 also provided good protection. The Pherocon SWD lure (Trecé) was shown to be effective for monitoring spotted wing drosophila in blueberries. Wild blueberries were a suitable host for SWD; however, more flies emerged from cultivated than wild blueberries. Number of spotted wing drosophila on traps placed near forest edge was higher than on traps placed near other

blueberry fields and in the field interior, indicating movement of flies from wild habitat into blueberry fields. Educational information on spotted wing drosophila was provided to over 200 blueberry growers mainly from New Jersey, Pennsylvania, and Maryland at various grower meetings. This information was also provided via newsletter articles.

PROJECT APPROACH

Activity; **Evaluate the toxicity of various insecticides with different modes of action against spotted wing drosophila.**

Large Plot Field Trials

In 2013, a study was conducted to determine the efficacy of employing a reduced-risk program (Delegate 30WG and Assail 30SG), a standard program (Imidan 20EF and Bifenture 10DF), or a program with the new reduced-risk insecticide Exirel (+ 0.25% Dynamic) against spotted wing drosophila on a mid-season 'Bluecrop' variety of high bush blueberries in New Jersey. Insecticide treatments for the reduced-risk and standard programs alternated each week.

The experiment was conducted in an abandoned blueberry farm located in Chatsworth, New Jersey. Plots consisted of 2 rows of approx. 16-20 bushes each, replicated four times in a complete randomized block design. Treatment rows were separated by single buffer rows, and treated plots were separated by 4-6 bushes. Applications were made with a Pak-Blast® model MBICO28 Sprayer on a John Deere 5320N Tractor. Sprays were applied on 10 July, 16 July, 22 July, and 30 July. Samples were taken from treated plots 7 days after the final spray on 6 Aug by picking five pint samples from each plot. Samples were kept in an incubator under a 14:10 h L:D at 24°C for 10-13 days and then evaluated from 16 August through 19 August. Samples were evaluated using the salt water extraction method that consisted of submerging fruit in warm salt water containing approx. 1000 ml of salt to 5 gal water causing any larvae to leave fruit. Larvae and pupae caught by a 30 mesh sieve were counted and the number of larvae and pupae per pint was calculated. Data were analyzed using ANOVA and means separation by Tukey test at $P = 0.05$. Data on number of larvae were ln (n+0.5) prior to analysis.

Among all programs Exirel provided the best control (98%), followed by the standard program (65% control), and the reduced-risk program (52% control).

In 2014, an experiment was conducted to determine the efficacy of Apta 15SC, Pyrifluquinazon, two rates of Danitol 0.83EC, and Imidan 70WP (grower standard) against spotted wing drosophila on the late-midseason 'Bluecrop' variety of high bush blueberries in New Jersey. The

treatments and rates were: Apta 15SC at 24 floz/ac, Pyrafluquinazone at 3.2 floz/ac, Danitol 0.83EC at 6 floz and 10.66 floz/ac, and Imidan 70WP at 3.33 lb./ac.

The experiment was conducted in an abandoned blueberry farm located in Chatsworth, New Jersey. Plots consisted of 2 rows of approximately 20-21 bushes each, replicated four times in a CRB design. Treatment rows were separated by single buffer rows, and treated plots were separated by 4-6 bushes. Applications were made with a Pak-Blast® model MBICO28 Plot Sprayer (Rear's Mfg. Co., Eugene, Oregon) on a John Deere 5320N Tractor. The sprayer was calibrated to deliver 50 gal of volume per acre at 300 psi using five nozzles with D3 orifices, yielding approximately 156.4ml (5.3 fl oz.) per bush. Three sprays were applied on 18 July, 24 July, and 31 July. Five treated terminals, each with 3 leaves and 75 ripe blueberries were taken from each treated plot on 25-July, 28 July, and 30 July. Each terminal, along with 15 loose berries from the same plot, was placed in an assay container consisting of a 32 oz. deli cup with a hole cut in the bottom in which a florist's water pick fit tightly. Terminals were supplied with water and were kept in a laboratory for the duration of the experiment. Flies were added to the assay containers within 4 hours after terminals were clipped from bushes. A total of 20 adults (10 females and 10 males) were added to each container. Flies were 3-5 days old at time of use and were sexually mature. Flies were anesthetized with small puffs of CO_2 gas injected into the rearing tubes to facilitate handling and placement in the assay containers. After flies were added to the assay containers, containers were placed on a light bench in a laboratory under a 14L:10D photoperiod, and at ambient temperature (~22-30°C) for 3 days prior to observation. Adult fly mortality data were collected on three dates after exposure to the treated fruit and foliage, 1 DAT was checked on 28 July, 3 DAT on 31 July, and 6 DAT on 2 August. Berries were removed from assay containers on day 7 and placed in 8 oz. deli containers. Samples were left to incubate on a light bench in the laboratory under a 14L:10D photoperiod at approximately 25°C for 10 days and then evaluated. Larval infestation data were collected using the salt water extraction method consisting of submerging the berries in warm salt water (~1000 ml NaCl : 5 gal H_2O), which causes larvae to leave fruit. All larvae and pupae caught by a 30 mesh sieve were counted and the number of larvae per berry was calculated (no. larvae/no. ripe fruit, "larvae" includes all larvae + pupae). Data were analyzed using ANOVA, and means separation by Fisher's LSD test at $P = 0.05$. Count data were ln(x+01) transformed prior to analysis. In addition, samples were taken from treated plots after the second and third sprays. Single pint samples were harvested from each plot 5 days after the 2nd spray on 29 July. Two more 1-pint samples were harvested from each plot 6 days after the third and final spray on 5 August. Samples were stored in ventilated 32oz deli containers and left to incubate on a light bench in the laboratory under a 14L:10D photoperiod at approximately 25°C for 10-14 days and then evaluated. Samples from 29 July were evaluated from the 8th through the 12th of August, while samples from 5-August were evaluated from the 15th through the 19th of August. Samples were evaluated for larval infestation using the salt water extraction method described above. All larvae and pupae caught by a 30 mesh sieve were counted and the number of larvae per pint calculated ("larvae" includes all larvae + pupae). The total number of berries per pint was counted, and the number of larvae per berry was then calculated (no. larvae/no. ripe fruit, "larvae" includes all larvae + pupae). Data were analyzed using ANOVA and means separation by Fisher's LSD test at $P = 0.05$. Count data were ln(x+01) transformed prior to analysis.

Imidan and Danitol provided good control: high adult mortality and low larval infestation. Pyrafluquinazone caused high fly mortality in the laboratory but did not prevent larval infestation. Apta did not provide good control against spotted wing drosophila.

Small Plot Field Trials

In 2013, we evaluated the efficacy of various chemical classes including neonicotinoids (Assail 30SG), pyrethroids (Danitol .83EC and Bifenture 10DF), diamides (Exirel 10SE), organophosphates (Imidan 70WP, Imidan liquid formulation, and Malathion 8 aquamul), spinosyn (Delegate 30WG), and tetramic acids (Movento) against spotted wing drosophila on high bush blueberry. The treatments and rates were: Bifenture 10DF at 12 and 16 oz./ac, Assail 30SG at 5.3 oz./ac, Movento (plus 0.25% MSO adjuvant) at 8 and 10 floz/ac, Danitol .83EC (plus 0.25% Dynamic adjuvant) at 5.33 and 10.7 floz/ac, Exirel 10SE (plus 0.25% Dynamic adjuvant) at 10.1, 13.5, and 20.5 floz/ac, Delegate 30WG at 6 oz./ac, Imidan 70WP at 1.33 lb./ac, Imidan liquid formulation at 32 floz/ac, and Malathion 8 aquamul at 2.5 pt/ac.

The study was conducted in a blueberry field, cv. 'Bluecrop,' located at the P.E. Marucci Blueberry/Cranberry Center in Chatsworth, New Jersey. Each treatment was repeated on three bushes, and treatments were separated by a 3-bush buffer. Applications were made on 5 July. Treated terminals with 2-3 clusters of ripe blueberries and two leaves attached were taken from each treated bush 1,3,and 7 days after treatment (DAT) on 6 July, 8 July, and 12 July, respectively. The terminals were placed in assay containers consisting of a 32 oz. deli container with a hole cut in the bottom in which a florist's water pick fit tightly. Terminals were supplied with water and kept in the laboratory during the length of the experiment. Flies were added to the assay containers within 2-3 hours after terminals were clipped from bushes. A total of 10 spotted wing drosophila adults (5 females and 5 males) were removed from a laboratory colony and kept in clean rearing tubes in a 25°C incubator for 2-3 hours before being released into the assay containers. Mature (3-4 days old) flies were used in the experiment. After flies were added to the assay containers, the containers were placed on a light bench in the laboratory at 25-28°C and 14L:10D. Adult fly mortality data were collected on day 1 and day 3 after initial exposure to the treated fruit. Fruit was allowed to incubate under the same laboratory conditions for 11 more days following the last adult observation, at which point larval count data were collected using the salt water extraction method. This method consisted of submerging the fruit samples in warm salt water (approx. 1000 ml of salt to 5 gal water) causing the larvae to exit the fruit. Larvae and pupae caught by a 30 mesh sieve were counted and the numbers per 10 berries were calculated (no. larvae+pupae/no. ripe fruit × 10). Data were analyzed using ANOVA and means separation by Fisher's LSD test at $P \leq 0.05$. Percent data were arcsine square-root transformed prior to analysis. The results show that at 1 DAT, Exirel (two highest rates), Assail, Imidan, Malathion, Bifenture (high rate), and Delegate provided > 70% control. At 3 DAT, Exirel (two highest rates), Imidan 70WP, and Delegate provided best control. At 7 DAT, only Exirel (highest rate), Imidan 70WP, and Delegate provided > 70% control.

All treatments, except for Movento, reduced the number of larvae in fruit compared with control at 1 DAT. At 3 DAT, Bifenture, Danitol, and Malathion were weaker than Exirel, Assail, Imidan, and Delegate in protecting fruit from larval infestation; Movento provided no protection.

At 7 DAT, Bifenture (high rate), Exirel, Imidan, and Delegate provided best protection against larval infestation.

In 2014, we conducted an experiment to determine the efficacy of two rates each of Exirel and Dibrom, one rate each of Ecozin, Atrapa (Malathion), Danitol, IKI-3106, Imidan 70WP (grower standard), and Delegate, and a combined Dibrom and Ecozin treatment against spotted wing drosophila on high bush blueberry in New Jersey. The treatments and rates were: Exirel 10SE at 8 and 16 floz/ac (plus 0.125% Dynamic), Dibrom at 0.5 and 1 pt/ac, Ecozin at 6 floz/ac, combined Dibrom and Ecozin at 1pt and 6floz/ac, respectively, Atrapa at 40 floz/ac, Danitol .83EC at 16 floz/ac, IKI-3106 at 22 floz/ac, Imidan 70WP at 3.33 lb. /ac, and Delegate 30WG at 6 oz. /ac.

This test was conducted in a mid-season variety blueberry field, cv. 'Bluecrop,' located at the P.E. Marucci Blueberry/Cranberry Center in Chatsworth, New Jersey. Each treatment was replicated three times in three different blocks (one replicate per block); blocks were separated by a 3-bush buffer. Applications were made weekly over a 3-week period, on 1 July, 8 July, and 17 July, with an R&D CO_2 backpack sprayer, using a 1.0 liter plastic bottle. The sprayer was calibrated to deliver 50 gal of vol per acre at 35 psi, using a single ConeJet TXVS 4 nozzle, yielding 156.4 ml (5.29 fl oz.) per bush. Treated terminals with 2-3 clusters of ripe blueberries and two leaves attached were taken from each treated bush 1 and 3 days after treatment (DAT) on 2 July and 4 July for the first week, 9 July and 11 July for the second week, and 18 Jul and 20 July for the third week of sampling. These terminals were placed in assay containers consisting of a 32 oz. deli cup with a hole cut in the bottom in which a florist's water pick fit tightly. Terminals were supplied with water and kept in a laboratory for the duration of the experiment. Before flies were added the number of berries in each terminal was counted. Flies were added to the assay containers within 2-3 hours after terminals were clipped from bushes. On week 1, 1 DAT, a total of 14 adult flies (7 females and 7 males) were removed from a laboratory colony and released into the assay containers, while on the remaining sampling dates a total of 20 adults (10 females and 10 males) were added to each container. Flies were 3-5 days old and were thus sexually mature. Flies were anesthetized with small puffs of CO_2 gas injected into rearing tubes to facilitate handling and placement of flies inside the assay containers. After flies were added to the assay containers, the containers were placed on a light bench in a laboratory under a 14L:10D photo period, and kept at ambient temperature (~20-35°C) for 3 days prior to observations to allow oviposition. Adult fly mortality data were collected on day 3 after exposure to the treated fruit and foliage. Berries were removed from assay containers on day 7, placed in 8 oz. deli containers, and incubated under the same conditions as described above for 10 more days before evaluation on day 17. Larval infestation data were collected using the salt water extraction method consisting of submerging the berries in warm salt water (~1000 ml NaCl : 5 gal H2O), which causes larvae to leave fruit. All larvae and pupae caught by a 30 mesh sieve were subsequently counted, and the number of larvae per berry calculated (no. larvae/no. ripe fruit, "larvae" includes all larvae + pupae). Data were analyzed using ANOVA, and means separation by Fisher's LSD test at $P = 0.05$. Percent data were arcsine square-root transformed & count data were ln(x+1) transformed prior to analysis.

On week 1, Imidan, Delegate, Exirel, IKI-3106, Danitol, Atrapa, and Dibrom provided good (> 90%) SWD control 1 DAT. Efficacy of all treatments decreased 3 DAT. On week 2, Imidan, Delegate, Exirel, Danitol, and Atrapa provided good protection against SWD 1 DAT. On week 3, Imidan, Delegate, Exirel, IKI-3106, Danitol, Atrapa, and Dibrom provided good (> 90%) SWD control 1 DAT. Imidan, Atrapa, Exirel, and IKI-3106 continued to provide > 90% protection 3 DAT.

Activity; **Develop effective monitoring tools for spotted wing drosophila.**
Studies were conducted in 2013 and 2014 to evaluate various baits for monitoring spotted wing drosophila. The traps used were all of the clear "deli cup" design.

In 2013, the bait types were: a) apple cider vinegar (ACV) with a drop of unscented soap; b) yeast and sugar – yeast, sugar, and water, + unscented soap; c) a fermenting bait consisting of whole wheat flour, water, sugar, ACV and yeast in a separate ventilated specimen cup within the larger deli cup containing a drowning solution of ACV, ethanol and unscented soap; d) DroskiDrink, a bait that consisted of ACV, red wine, brown (muscovado) sugar, and soap; e) a synthetic lure over ACV; And, f) a synthetic lure over drowning solution. The fermenting bait and synthetic lure over ACV captured more flies than the other baits. Comparable numbers of males and females were captured in fermenting baits and synthetic lures over ACV, and more females were captured overall. While the ACV-baited traps have been the standard for monitoring spotted wing drosophila, and were used in previous years, all baits/lures captured flies 1-2 weeks earlier than ACV.

In 2014, a similar study evaluated six bait types: a) a Kombucha bait, a fermented drink made of tea, sugar, bacteria, and yeast; b) a fruit volatile-based bait; c) a Suzukii bait (Bioiberica S.A., Barcelona, Spain); d) Apple cider vinegar (ACV); e) a commercially-available Pherocon SWD lure (Trecé, http://www.trece.com/PDF/Pherocon_SWD_flyer.pdf); And f) red raspberry essence (Kerr Concentrates Inc., Salem, OR). The study was conducted between June 6 and August 20, 2014 at 5 locations that used minimal pesticide applications. Each treatment was poured into a red solo cup with clear lids and hung in the blueberry fields. The total number of male and female SWD was counted and recorded each week and the seasonal accumulated number of SWD was calculated for each treatment. In addition, from July 31 to August 20, non SWD found in each trap were also counted to determine how species specific each attractant was. Results show that the Suzukii bait and the Trecé lure were the most attractive to the SWD throughout the 2014 season, capturing 771 and 816 SWD, respectively. These results indicate that the commercial lures are more effective at capturing SWD compared to homemade attractants. In addition, all of the attractant traps accumulated less than 100 non SWD. The first catch of SWD was recorded during the week of June 29, 2014.

Activity; **Assess wild hosts of spotted wing drosophila and spatial relationship to crop infestation.**
In 2014, we conducted studies to determine the susceptibility of wild blueberries to spotted wing drosophila infestation. Fruits from two cultivated varieties (Duke and Bluecrop) and one wild parent of blueberry near cultivated fields were collected from commercial farms in New Jersey. Sampling was carried out in June, July, and August; once a week. Fifteen clusters were collected

per site for each genotype on each sampling date. There were a total of 10-20 sites. Collected samples were weighed.

To assess spotted wing drosophila infestation in wild and cultivated berries, 5 to 10 clusters per type were placed in plastic containers. After 14 days the number of spotted wing drosophila larvae and pupae in each of the samples was quantified. In addition, choice tests were conducted. In these studies, 5-10 cultivated blueberry fruits and another with the same amount wild blueberries fruits were placed in cages. Spotted wing drosophila adults (5 males and 5 females) were placed inside the cage for 24 hours to oviposit on berries. After 14 days the number of spotted wing drosophila larvae or pupae was quantified in each one of the samples.

At each sampling date, surface penetration force was measured in centinewtons (cN) on ten fruit each for wild and cultivated fruit using a Wagner gram force gauge fitted with a blunted number 3 insect pin. Brix was also quantified as a measure of sugar content.

Approximately four times higher spotted wing drosophila numbers emerged from cultivated than from wild berries. Similarly, in choice assays, approx. 6x more spotted wing drosophila emerged from cultivated than from wild berries. Firmness was approx. 1.5x greater in cultivated than in wild blueberries. Brix was approx. 1.3x higher in wild than in cultivated berries. These results indicate that neither firmness nor Brix were responsible for the higher infestation of spotted wing drosophila in cultivated berries. Cultivated berries were, however, about 2x bigger than wild berries, indicating that higher infestation in cultivated berries might be due to more resources available for larval development.

Activity; **Identify habitats associated with spotted wing drosophila infestations in blueberry farms in New Jersey.**

Eight farms from New Jersey, six from Atlantic Co. and two from Burlington Co., were included were monitored for spotted wing drosophila. Farms varied in size and blueberry varieties grown. All farms were profiled and mapped using Geographic Information Systems (GIS). GPS coordinates for each trap location were recorded using a hand-held GPS unit and high-resolution digital orthoimages were imported into a GIS. Land cover for New Jersey sites was determined using the 2007 LU/LC data set (NJ Dept. Environmental Protection, Office of Information Resources Management, Bureau of Geographic Information System). The following designations were used for land cover types: blueberry, agriculture, open space, forest, water, roads, and buildings. Agriculture included any non-blueberry crop land including tree nurseries. Open space included bare ground around blueberry field margins, turf or any other low-growing vegetation. Total farm land cover was determined by measuring a circular area surrounding each farm. The radius of each circular area extended from the farm center to the furthest trap plus 55 m (the distance blueberry maggot adults can fly according to Rodriguez-Saona, unpublished data). The proportion of area covered by blueberry fields, forest, and open space were measured. We sampled for SWD adults on a weekly basis from the end of blueberry bloom through harvest. Traps for adult flies were placed at a density of 1 trap per 5-10 acres depending on farm size. Traps were baited with apple cider vinegar.

Trap capture data were analyzed to determine differences in mean capture among the following three geo-spatial/landscape categories: a) blueberry fields adjacent to the forest, b) blueberry fields adjacent to open areas or other crops, c) inside blueberry fields. Open areas less than five meters wide that separated traps from forest or blueberry fields were disregarded when determining these categories. Categories were compared using analysis of variance (ANOVA) and mean separation tests using Tukey's HSD (PROC GLM, SAS). Model parameters were perimeter land cover, sample date, and their interaction. Trap data were inverse (x+1) transformed to achieve normality and satisfy model assumptions. The relationship between SWD abundance and proportion land cover by farm was analyzed using linear regression (PROC REG). Mean trap catch for each farm were pooled and regressed on the proportion of each of the key land cover types.

In New Jersey blueberry farms, greater spotted wing drosophila fly numbers were caught on traps placed in blueberry fields adjacent to the forest than in blueberry fields adjacent to open areas and inside blueberry fields ($F = 38.52$; $df = 2, 1851$; $P < 0.0001$). We found no strong relationship between spotted wing drosophila trap captures and percent agriculture ($y = -2.3875x + 138.2$, $R^2 = 0.0949$) and percent forest ($y = -0.4932x + 65.608$, $R^2 = 0.0084$).

Activity; **Extension and outreach plan.**
A workshop on how to perform salt extractions to monitor spotted wing drosophila larvae was conducted at the Rutgers Cooperative Extension (RCE) Blueberry Twilight meeting on April 24, 2013, and on May 22, 2014. Approximately 50 growers attended each of these meetings. Ongoing research outlined in this project was presented at the RCE Blueberry Twilight meetings on May 20, 2013, and on May 22, 2014. Approximately 50 growers attended each of these meetings. Results from these experiments were presented at the "Raspberries/Blackberries" and "Blueberries" sessions at the Atlantic Fruit & Vegetable Convention (January 28-30, 2014) in Hershey, Pennsylvania, (about 150 growers attended both of these sessions), and at the "Insects & Disease Hot Topics" and "Blueberries" sessions at the Atlantic Coast Agricultural Convention and Trade Show (February 4-6, 2014) in Atlantic City, New Jersey (about 100 growers attended both of these sessions). These meetings were attended by regional growers, extension specialists, IPM and county agents, regulatory agency personnel, and industry representatives. Information on spotted wing drosophila and updates on our research were also provided in newsletter articles (Blueberry Bulletin and Plant-and-Pest Advisory, RCE).

A grower survey was conducted to measure impact of spotted wing drosophila in blueberries at the RCE Blueberry Twilight meetings on May 20, 2013, and on May 22, 2014.

In 2013, post-presentation, the majority of respondents (73% out of 15) indicated knowledge on adult SWD identification and fruit infestation. Less (50%) expressed knowledge on larval identification. The majority of respondents (80%) currently monitor for SWD, indicating knowledge on baits and trapping methods. Most NJ blueberry growers (78%) are very or extremely concerned about SWD.

In 2014, all the respondents (100% out of 11) indicated knowledge on adult SWD identification (a 25% increase over the previous year). However, only 73% indicated knowledge on larval

identification and fruit infestation (percentages higher or equal to 2013). 90% of the respondents indicated knowledge on monitoring (a 10% increase from 2013), and 100% monitor for SWD. 90% of respondents were very or extremely concerned about SWD (a >10% increase from the previous year).

Overall, the results from the 2013 and 2014 surveys indicate an increase in knowledge among NJ blueberry growers on SWD identification, an increase in monitoring efforts, and an increase in growers' general awareness.

Significant Contributions:

- New Jersey blueberry growers have followed our recommendations based on insecticides trials. The following insecticides are recommended to control SWD: Imidan, Malathion, Delegate, Exirel, Bifenture, Danitol, and Lannate. The unregistered insecticide IKI-3106 also provided good SWD protection.
- The Pherocon SWD lure (Trecé) was shown to be effective for monitoring SWD in blueberries. This lure will be recommended to growers to monitor SWD.
- Wild blueberries were a suitable host for SWD; however, more flies emerged from cultivated than wild blueberries.
- Number of SWD on traps placed near forest edge was higher than on traps placed near other blueberry fields and in the field interior, indicating movement of flies from wild habitat into blueberry fields.
- Educational information on SWD was provided to over 200 blueberry growers mainly from New Jersey, Pennsylvania, and Maryland at various grower meetings. This information was also provided via newsletter articles.
- We partnered with chemical companies to work towards increased adoption of reduced-risk insecticides such as Delegate and Exirel for SWD. Also we are working with IR-4 towards to registration of new products.

GOALS AND OUTCOMES ACHIEVED

In 2014, at least 40 growers (out of 120) had acreage monitored for SWD. Based on post-presentation surveys, there was a 25% increase in grower knowledge on adult SWD identification in 2014 as compared with 2013. There was also a 10% increase in knowledge on SWD monitoring and management in 2014 as compared with 2013. The improved SWD management strategies in 2014 against SWD have come at a cost of 2.5 to 3 times the insecticide being used now for SWD management as compared to before 2011 when SWD was not present in New Jersey.

The toxicity of various insecticides with different modes of action was evaluated against spotted wing drosophila. The following chemical classes of insecticides were evaluated: organophosphates, neonicotinoids, pyrethroids, diamides, spinosyns, as well as novel new classes of insecticides.

We worked with researchers from the US to test new monitoring tools effective in New Jersey. A manuscript was submitted and is in press from our 2013 research: Burrack, H.J., Asplen M.,

Bahder L., Collins, J., Drummond F.A., Guédot C., Isaacs, R., Johnson D., Blanton A., Lee J.C., Loeb G., Rodriguez-Saona, C., Van Timmeren, S., Walsh D., and McPhie D.R. 2015. Multi-state comparison of attractants for monitoring *Drosophila suzukii* (Diptera: Drosophilidae) in blueberries and cranberries. Environmental Entomology. In Press.

We assessed the susceptibility of wild blueberries to spotted wing drosophila. We studied the levels of spotted wing drosophila infestation of wild hosts to determine potential sources of crop infestation.

We identified habitats associated with spotted wing drosophila infestations in blueberry farms in New Jersey.

We conducted an extensive extension and outreach program to increase grower understanding of ways to track and manage spotted wing drosophila.

Grower increased their understanding of ways to identify, track and manage spotted wing drosophila as measured through post-presentation surveys.

At least 200 growers attended presentations given on this project at meetings.

This project improved the ability of New Jersey blueberry growers to determine whether spotted wing drosophila is present on their farm and in their fruit, to track spotted wing drosophila populations, and to identify and use sustainable management tools. Cooperative extension agents are now able to recommend the best management methods currently available.

New Jersey blueberry growers are now able to monitor spotted wing drosophila presence, and use minimally disruptive, sustainable management tools in areas at high risk. Rutgers Cooperative Extension agents were informed about management and deliver high impact tools.

In the long term, based on our recommendations, we expect on-farm pesticide use to be minimized, which in turn will minimize non-target pest and environmental impacts. We also expect spotted wing drosophila infestation rates in harvested fruit to decrease, resulting in less rejected product and high value to the grower.

BENEFICIARIES

A total of at least 120 New Jersey growers benefited for this project. No commercial growers had marketplace rejections of fruit due to maggot infestation.

The beneficiaries of this project include:

Fruit growers, including not just blueberry but also raspberry growers from New Jersey and other US states.

Packers, processors, marketers and export agencies will be able to access, sell, and export better quality of fruit.

Fruit consumers will be able to buy better quality of fruit.

Extension personnel were provided with information to help growers in making informed management decisions.

LESSONS LEARNED

1. We identified the best insecticide options for controlling spotted wing drosophila in blueberries in New Jersey. The following insecticides were effective against spotted wing drosophila: Imidan, Malathion, Delegate, Exirel, Bifenture, Danitol, and Lannate. These insecticides are being recommended to control spotted wing drosophila in blueberries in New Jersey. The unregistered insecticide IKI-3106 provided good protection. We will work with the manufacturer towards registration of this insecticide.

2. We identified new and better monitoring tools that are effective in New Jersey. The Pherocon SWD lure (Trecé) was shown to be effective for monitoring spotted wing drosophila in blueberries. This lure will be recommended for monitoring spotted wing drosophila in blueberries in New Jersey until a more effective attractant is identified.

3. We identified potential sources of spotted wing drosophila infestation. Wild blueberries were a suitable host for SWD; however, more flies emerged from cultivated than wild blueberries.

4. We identified habitats associated with spotted wing drosophila infestations in blueberry farms in New Jersey. Number of spotted wing drosophila on traps placed near forest edge was higher than on traps placed near other blueberry fields and in the field interior, indicating movement of flies from wild habitat into blueberry fields.

CONTACT PERSON

Joe Darlington, Chair
New Jersey Blueberry and Cranberry Research Council, Inc.
1 Pasadena Road
Browns Mills, NJ 08015
Tel: 609 983-2316
Fax: 609 893-2332
E-mail: JOE@888CRANBOG.COM

ADDITIONAL INFORMATION

The following manuscript is in press:

Burrack, H.J., Asplen M., Bahder L., Collins, J., Drummond F.A., Guédot C., Isaacs, R., Johnson D., Blanton A., Lee J.C., Loeb G., Rodriguez-Saona, C., Van Timmeren, S., Walsh D., and McPhie D.R. 2015. Multi-state comparison of attractants for monitoring *Drosophila suzukii* (Diptera: Drosophilae) in blueberries and cranberries. Environmental Entomology. In Press.

SCBG Agreement # 12-25-B-1476
Final Performance Report
December 29, 2015

New Jersey Department of Agriculture

PROJECT TITLE;
"**Project designed to maximize the effectiveness of the Jersey Fresh and Jersey Grown product branding and advertising programs in 2013**"

PROJECT SUMMARY

1) This project supported New Jersey's $ 250 million fruit and vegetable industry promoting the Jersey Fresh brand on television, radio, at the point of sale and on the internet.

   New Jersey continues to lose specialty crop acreage. Through the Jersey Fresh product promotion and branding program this project provided support for all of the fruit and vegetable growers throughout the Garden State. The Jersey Fresh program benefits from high in-state brand recognition by consumers. According to consumer research Jersey Fresh fruits and vegetables rate higher in quality and freshness that then out of state produce.

2) New Jersey continues to lose specialty crop acreage. It is more important than ever to assist specialty crop growers as the current age of a farmer in New Jersey in 2012 was 59 years old. With the current generation of specialty crop producers retiring soon the next generation must make a decision whether or not to stay in farming. This program is important due to its positive impact on creating and/or maintaining demand for all specialty crops in the Garden State.

3) Advertising and branding is not a "one and done" process. Advertising is an ongoing process that requires continual doing in order to keep it top of mind and not have your message crowded out by other messages.

   This project has built on past SCBG's which have also supported consumer awareness and recognition of the Jersey Fresh brand. All of these efforts have followed the same market development and product promotion process which has created and maintained an impressive total brand awareness of 79% which is greater than Ready Pac, Foxy and Bonita brands. All past and current SCBG activities have featured the same Jersey Fresh logo which has been in use since 1984. Creating and maintaining high consumer brand awareness is an indication of a successful marketing campaign. Continuing high consumer demand for a brand is an indication of a quality product. Furthermore support from retailers for shelf space in the produce aisle requires a shared benefit in promoting Jersey Fresh specialty crops. The NJDA has maintained the same Jersey Fresh brand and logo for the past 31 years so that every effort builds upon all of the previous efforts. Due to advertising and product promotion, retailer support and a well-recognized brand the Jersey Fresh program continues to be the most efficient methodology of supporting specialty crops in the State of New Jersey.

Project Approach

1) Non Applicable. According to the law items promoted by the Jersey Fresh program must be fruits and vegetables.

2) Significant Contributions

NJDA Jersey Fresh Project Staff:

Al Murray, Assistant Secretary of Agriculture, the administrator of the Jersey fresh program provides oversight for project development and approves the budget, projects and creative themes.

Joe Atchison, Market Development Representative, is providing Jersey Fresh product development and procurement services.

William Walker, Agricultural Marketing Specialist, provides professional marketing support, supervises the Jersey Fresh interns and assists in point of purchase advertising materials distribution.

Logan Brown, Economic Development Representative, serves as the projects reporting and compliance officer.

Princeton Partners, Inc. is responsible for activities that relate to media development and placement and other advertising services
Jeff Cheseman
President
Princeton Forrestal Village
205 Rockingham Row
Princeton, NJ 08540
Tel; 609 452-8500

The following individuals were responsible for specific aspects of the Jersey Grown elements in this project;
Jersey Grown Point of Sale Advertising Items; Joe Atchison, NJDA
Jersey Grown Website Development; Lynne Richmond, NJDA Public Information Officer.
Jersey Grown Trade Show Display; Dominick Mondi NJNLA
Jersey Grown Printing; Joe Atchison, NJDA

GOALS AND OUTCOMES ACHIEVED

Jersey Fresh Intern Program
Two interns worked from June 2013 to mid-September 2013. The interns assisted the Jersey Fresh Promotional Marketing Program in efforts to advertise and promote New Jersey produced specialty crops.

As their principal work assignment they conducted retail store visits and distributed Jersey fresh point of sale advertising items directly to retail supermarket produce section staff throughout the State of New Jersey. The interns also assisting the staff of the Jersey Fresh program in the timely completion of orders for point of sale advertising and responding to other consumer requests.

Print Advertising
Food Trade News and Food World

Food World and Food Trade News cover the retail food industry in the geographic area from Metro NY to South Carolina. Retail Food industry includes all channels of distribution, from supermarkets to club stores, mass merchandisers, and discount stores. Papers are distributed to the corporate offices of the likes of Safeway, Costco, Wal-Mart and Ahold USA, just to name a few. In addition, the paper goes to every retailer in the area...each store receives a copy. Food Trade news has a circulation of 26,109 and Food World has a circulation of 21,572.

• Food Trade Issues:
- o June 17th: Retail Market Study issue
- o August 19th: Direct Store Delivery/Manufactures issue
- o September 16th: Natural and Organics Issue
- o October 14th: Produce Issue (bonus circulation at PMA Fresh Summit in New Orleans, LA)

• Food World Issues: o June 10th: Retail Market Study Issue
- o July 1st: Holiday Merchandising Issue
- o August 5th: Direct store delivery/ Manufacturers Issue
- o October 7th: Produce Issue (bonus circulation at PMA Fresh Summit in New Orleans, LA)

Produce News: The Produce News, published since 1897, is a BPA audited publication, with a circulation of over 13,000. It is the leading trade publication in the fresh produce industry. We will be receiving one issue for free.

• Issue: o May 6th – United Fresh Convention Issue
- o June 3rd – New Jersey Produce Section
- o June 17th - New Jersey Blueberry Section
- o July 15th – New Jersey Peach Section
- o September 9th – New Jersey Fall Produce Section
- o October 21st – PMA Convention Issue
- o November 18th- New York Produce Section (Free Issue)

The Packer: *The Packer* is the authoritative voice and leading source for news and information on fresh fruit and vegetable marketing, covering every aspect of the produce industry. The circulation is over 13,000

• Issues: o May 20th: Pepper Marketing Issue
- o June 3rd: New Jersey Produce Sections
- o August 5th: Locally Grown Marketing
- o One other Issue TBD

The Packer Guide: An annual buyers' guide, *The Guide* is the most complete listing available for sources of fruits, vegetables and specialty items, highlighted in individual sections with marketing tips and handling information. Published annually in June.

Edible NJ: *Edible Jersey* celebrates the local, seasonal food of the Garden State. Brimming with engaging articles and enticing photography, *Edible Jersey* tells the story of food, from source to

table, spotlighting the growers, producers, fishermen, vintners, retailers, chefs, home cooks, and others who energize our culinary community. *Edible Jersey* has a readership of over 140,000.

• Issues:
  - o Summer (FP and 3 - ¼ pages)
  - o High Summer (3 - ¼ pages)
  - o Fall (3 – ¼ Pages)

Produce Business: *Produce Business* generates ideas that initiate industry improvement. They have a large circulation of produce decision-makers in the produce industry. The circulation represents over 70,000 stores. *Produce Business* also guaranties that the NJDA's ad will be positioned with articles that give the ads more impact and exposure.

• Issues: o May: State Departments of Agriculture Special Report
  - o June: Marketing Jersey Fresh's Bounty
  - o October: PMA Issue

A quick analysis of the Department's Jersey Fresh website from April 2013 to December 2013 showed a marked increase in traffic during the period of June-September.

<u>Radio Advertising</u>

Highlights

• 4 station radio buy
• 7 week schedule on each station
• Estimated Total Impressions: 3,276,000
• Spread out the weeks to have radio presence for 10 consecutive weeks from June 3rd to August 11th.
  - • Day parts
    - o Friday 3p-7p
    - o Friday 7p-11p
    - o Sa 6a-7p
    - o Su 6a-7p

• Stations o 101.5 WKXW
  - ☐ Coverage: 50,000 watts of power to cover 10 New Jersey Counties
  - ☐ Demo: Adults 25-54/35-64
  - ☐ Format: News/Hot Talk-Jersey Talk
  - ☐ 15 spots per week
  - ☐ Total Estimated Impressions: 2,079,000

o 96.9 WFPG ☐ Coverage: 50,000 w
  - ☐ Demo: Adults 25-54/35-64
  - ☐ Format: Soft Adult Contemporary
  - ☐ 20 spots per week
  - ☐ Lite Rock Station
  - ☐ Total Estimated Impressions: 485,100

o 107.3 WPUR ☐ Coverage: Atlantic, C

- ☐ Demo: Adults 25-54
- ☐ Format: Hot New Country
- ☐ 20 spots per week
- ☐ South Jersey's Country Rock Station
- ☐ Total Estimated Impressions: 431,900

o 1049.9 SJO ☐ Coverage: Burlingto

Atlantic and Cape May Counties

- ☐ Demo: Women 25-44
- ☐ Format: Hot Adult Contemporary
- ☐ 20 spots per week
- ☐ South Jerseys Own Variety
- ☐ Total Estimated Impressions: 280,000

Jersey Fresh Point of Sale Advertising

Point of sale advertising items including the following items has been purchased; price cards, stickers, truck decals, pennants, banners, hats, aprons, bin wrap and store signs.

Jersey Grown Point of Sale Advertising

A joint New Jersey Department of Agriculture and New Jersey Nursery and Landscape Association team consisting of Joe Atchison, NJDA and Dominick Mondi, NJNLA worked to complete the Jersey Grown point of purchase advertising elements of this project in 2015. The following point of sale advertising were created; price tags, trunk liners, ground stakes and Consumer plastic bags were created with the Jersey Grown logo and displayed or distributed to consumers at the point of sale. The items listed were determined to be the most effective at reinforcing the Jersey Grown logo at the point of sale.

Jersey Grown Website Development

The website was developed with in-kind contributions from the NJDA Public Information Officer. See; http://www.jerseygrown.nj.gov/

Jersey Grown Trade Show Display

The New Jersey Nursery & Landscapers Association worked with Image 360 of Marlton, NJ to create a free standing display promoting the Jersey Grown logo and the State's horticultural crops.

Media Buyers Commission

These fees were paid as the cost of media placement. The project staff monitored the fulfillment of the expected measurable outcomes by tracking the number of published print advertisements and the frequency of radio ads that are broadcast.

The following benchmarks, goals and results used to measure the expected outcome for this project follow;

- **What is the consumer inclination to purchase fruits and vegetables if they are advertised as Jersey Fresh?**

  The 2002 Benchmark for this question is 45%
  The response to this question in the survey released in January 2013 was 66%.
  The response to this question in the survey released in September 2013 was 70%.
  The response to this question in the survey released in October 2014 was 67%.

  This response is still in the high range as the last three years have ranged from 66% to 70." The 2014 survey placed in the middle at 67%. Seasonal quality and supply variations can account for the minor differences from year to year.

- **As a consumer are you aware of the promotion of New Jersey Farm products as Jersey Fresh?**

  The 2002 Benchmark for this question is 41%.
  The response to this question in the survey released in January 2013 was 78%.
  The response to this question in the survey released in September 2013 was 78%.
  The response to this question in the survey released in October 2014 was 79%.

  This response is still in the high range as the last three years have ranged from 78% to 79%." The 2014 survey placed on the high end at 79%. Seasonal quality and supply variations can account for the minor differences from year to year.

- **Are you "not likely," "likely" or "very likely" to ask for New Jersey produce if it is NOT identified?**

  The 2002 Benchmark for this question is a combined 40% for likely and very likely responses.
  The response to this question in the survey released in January 2013 was 51%
  The response to this question in the survey released in September 2013 was 46%
  The response to this question in the survey released in October 2014 was 50%

  This response is still in the mid-range as the last three years have ranged from 46% to 51%." The 2014 survey placed in the middle at 50%. Seasonal quality and supply variations can account for the minor differences from year to year.

- **Do you perceive New Jersey fruits and vegetables to be of higher quality in comparison to out of state competition?**

  The 2002 Benchmark for this question is a preference for the following New Jersey fruits and vegetables; Tomatoes 71%, Corn 58%, and Blueberries 43%.

  The response to this question in the survey released in January 2013 was Tomatoes 76%, Corn 71%, and Blueberries 62%.

  The response to this question in the survey released in September 2013 was Tomatoes 78%, Corn 72%, and Blueberries 62%.

  The response to this question in the survey released in October 2014 was Tomatoes 76%, Corn 71%, and Blueberries 68%.

  This response is still in the mid to high-range as the last three years have ranged from 62% to 78%." The 2014 survey placed on the high end with the average perception of higher quality averaging out to 75%. Seasonal quality and supply variations can account for the minor differences from year to year.

The first tracking study for the Jersey Fresh program since 2002 was conducted after the 2012 season from December 12, 2012 to January 13, 2013. The tracking study following the 2013 season was conducted in September 2013. The most recent tracking study, with results above, for this project was completed October 2014.

BENEFICIARIES

This project benefited about $500 million of fruits and vegetables, nursery and greenhouse horticultural products in New Jersey.

The impact of Jersey Fresh advertising and promotional efforts has been documented as $31.54* in new revenues for every dollar spent on the Jersey Fresh program. Therefore the potential impact of this project is expected to be about $11.4 million. (*"Returns to the Jersey Fresh Promotional Program, the Impacts of Promotional expenditures on Farm Cash Receipts in New Jersey" Ramu Godvindasmy, Rutgers, The State University, March 2004.)

LESSONS LEARNED

1) The Jersey Fresh advertising and promotional campaigns continue to be both effective and popular with growers and the consuming public.
2) Part of this success has been the fact that the core brand logo has remained unchanged for the past 31 years.
3) The Jersey Fresh brand identity continues to be strong both with growers and consumers. The years of investment in the program, combined with more than a century NJDA staff time, has made an effective combination to create and sustain this powerful program.

ADDITIONAL INFORMATION
Can be provided upon request

CONTACT PERSON
John Logan Brown
Economic Development Representative
New Jersey Department of Agriculture
P.O. Box 330
Trenton, NJ 08625
PH: 609 292-8856
Logan.brown@ag.state.nj.us

New Jersey Farm Bureau
SCBG Agreement # 12-25-B-1476
Final Performance Report
New Jersey Farm to School Network
January 19, 2016

PROJECT TITLE
"Experiments in the Distribution of Fresh Produce in Farm to School Food Service: Innovations in Social Media between Farmers and End Users".

PROJECT SUMMARY
New Jersey Farm Bureau (NJFB) in collaboration with the New Jersey Farm to School Network (NJF2S) will enhance the competiveness of specialty crops in New Jersey schools through utilizing the Specialty Crop Block grant funding, NJFB will work with NJF2S to develop relationships between NJ produce growers and school food service professionals through direct business to business social networking channels utilizing a private Twitter account to encourage direct communication between producer and end user.

The importance of this effort is based on the barriers that exist between farmers and the schools in their region who do not have direct access to produce grown locally. Because the produce delivery system that exists to accommodate school meals is set up for the national and global produce supply, small and medium size growers do not have access to communication channels to share their availability and pricing details.

The project was not built on a previously funded project with the SCBGP or SCBGP-FB.

PROJECT APPROACH
Several Twitter Trainings took place at both the New Jersey State Vegetable Growers Association Convention in Atlantic City (February 2013) and on site at several participants homes and place of work (2013-2014). It was determined that the efforts to encourage the use of personal cell phones to be a communication tool using social media and private Twitter programs was a generation ahead of its time.

The New Jersey Farm Bureau and New Jersey Farm to School Network convened five farmers and five food service professionals over a period of 18 months to teach all parties to utilize the private Twitter program that NJ Farm to School developed. See the attached document that was used as a training manual for the participants to understand the fundamentals of using their cell phones to communicate via Twitter. It became evident that this technology, although free and easily accessed from any smart phone, was not a "natural" fit for either industry at this juncture. Only the participants under 30 years of age took to the use of the program and those who were

older just never “got it”. The capacity for farmers utilizing this technology in real time to share pricing, availability and special deal information is novel in that there doesn’t exist that direct relationship to date between these two entities and by creating this channel, it is assumed that demand for local produce will increase, bringing about improved efforts on the part of produce distributors to meet this increased demand.

GOALS AND OUTCOMES ACHIEVED

Our goals to connect farmers and food service directors were shortchanged by the realities of the two different industry operations. Seasonality, availability and lack of communication through produce distributors all created issues that worked against local procurement. We did have one success story from this effort by connecting one of the farmers, a northern New Jersey greenhouse with Sodexo, a food service management company, eventually assisting to have the grower become an “approved vendor” for Sodexo’s 400 schools in New Jersey. The initial introduction between these two entities occurred at our original training in February 2013 and continued throughout that year online (these two individuals were younger than most of our other participants…).

Our limited success and accomplishments in this endeavor should not take away from the potential for this type of direct communication in the future. Providing a farm operator with an option to write a quick line of communication about any particular product could have the potential to increase demand from the end user. Or, providing this training to the produce distributors so that they are able to communicate this way with the schools might be another opportunity to drive demand.

We held one group and at least five one-on-one trainings with farmers and food service directors but came to the conclusion that there just wasn’t enough support for the time it was taking to familiarize the participants with the technology. That is why we suggest that this be done in five to ten years when there would hopefully be a younger group of participants whose use of cell phone technology is already a given, and where the training could focus on the actual marketing tools to write Tweets that advertise supply and communicate demand on the end user’s part.

We regret that we are returning a portion of this grant funding but appreciate the opportunity to have tried this idea out.

BENEFICIARIES

The farmers who participated in the trainings were:

1. Kevin Flaim, Flaim Farms
2. Pegi Ballister Howells-farmer cooperative representative
3. Alex Tonetta-A. Tonetta and Son

4. Matthew Sytsema-Griggstown Farm
5. Steve Vande Vrede-Edible Gardens

The food service directors who participated in the trainings were:

1. Gary Giberson, Sustainable Fare Food Service Management Company
2. Anthony Kowalak, Sodexo
3. Sal Valenza-NuWay Concessionaires
4. Dan Witkowski-NutriServe Food Management Company
5. Sue Solleder-Jersey City School District

The number of beneficiaries affected by the project's accomplishments and/or the potential economic impact of the project cannot be determined because of the limited success of the project.

LESSONS LEARNED

Social media has been broadly defined to refer to 'the many relatively inexpensive and widely accessible electronic tools that enable anyone to publish and access information, collaborate on a common effort, or build relationships.

Our original work plan was solely focused on Farm to School programs, which are increasingly seen as a means to increase the market share of locally grown foods in regional school districts. The growing Farm to School movement, which is now featured in all 50 states, is the reason behind the federal legislation passed in 2010 to designate October as "National Farm to School Month". In addition, New Jersey legislators ratified a state law, designating the last week in September as "Jersey Fresh Farm to School Week" to encourage schools across the state to serve local foods and to highlight them as being important to the state's economy and the health of students.

However, no matter how attractive the use of social media might be, the users must be of the age to easily access, utilize and distribute the technological tools that cell phone communication provides. We had envisioned a farmers standing in his field, looking at his lettuce crop that was coming in in the next week and putting a quick Tweet out to let customers know this information. We hadn't expected that just the simple act of truly using that phone to do so would cause so much frustration and consternation for those who were not accustomed to using Twitter on a daily basis. This idea, was truly, a generation ahead of its time and we would encourage someone in the next generation of farmers to dive into this on a more systemic basis to utilize this direct communication tool for grower and buyer, even for all buyers, not just schools.

ADDITIONAL INFORMATION

Please see attached guide.

CONTACT PERSON

Peter Furey
Executive Director
Telephone: 609-393-7163
Fax: 609-599-1209

E-mail: pfurey9119@aol.com

Beth Feehan
Director
New Jersey Farm to School Network
425 Greenwood Ave
Trenton, NJ 08609
Ph. 609-577-5113
E-mail: bfeehan@comcast.net

FINAL PERFORMANCE REPORT

New Jersey Peach Promotion Council
USDA AMS Agreement Number (12-25-B-1476)
Type of Report - Final Performance Report
Date of the Report; Revised April 15, 2016

PROJECT TITLE
"Promote and Handle Jersey Fresh Peaches"

PROJECT SUMMARY
We continued expand the scope of our promotional campaign by incorporating new promotional activities into our program; to maintain a fresh and viable marketing theme; to maintain a viable and up to date website, providing more information and interaction to users; to continue with and expand on our educational outreach and dissemination of industry information which have proven to be successful endeavors in recent years; and to have a larger impact, overall, on our target audiences.

Most of our focus will continued to be on the New Jersey metropolitan area including Philadelphia and New York, but some of our efforts went beyond this geographical territory.

The New Jersey peach industry continued to be an important agricultural industry in the state with slightly over 5,000 acres in production. New Jersey continues to be faced with an increasingly competitive market. New Jersey is still ranked 4th in the US in peach production in the United States. Peaches from California, South Carolina and Georgia, as well as other states, continued to pressure New Jersey peach markets during the summers of 2013, 2014 and 2015. In addition, the New Jersey peach industry continued to face competition from many other produce commodities on the limited shelf space in the produce section of retail establishments. Over 16 different varieties of apples continued to take major squeeze on the shelf space available to NJ peach shippers, most peaches are retailed by large food retailers who have increasingly demanded requirements and improvements on food safety, packaging and general category management.

It is crucial to the viability of the New Jersey peach industry that we reach consumers, enticing them to consume more peaches, and, likewise, it is of important that we induce retailers to focus

on carrying peaches grown and harvested in New Jersey, fostering an environment in which New Jersey's peach industry will be sustainable and profitable.

This project focused on creating and maintaining awareness about the New Jersey peach industry and the quality attributes of New Jersey peaches leading to strong consumer recognition and strong buyer support which will help keep the New Jersey peach industry viable. Because we are in the backyard of millions of consumers we focused on creating demand for local peaches. Because they were local we emphasized the advantages of Jersey Fresh closer to tree ripeness and higher flavor and overall quality. Our theme was simply delicious and nutritious. We tried to focus on promoting the health aspects and nutrition of Jersey peaches. We focused on utilizing new promotional tools, e.g. social media, as well as exploring opportunities for new market channels. In both 2013 and 2014 we were able to stabilize many of our markets. Finally in 2015 we saw increases in demand and movement and better prices and profitability for our growers. Thankfully our growers needed 2015 to fund capital improvements like planting new orchards and new varieties and to improving their storage and handling facilities. This will hopefully improve their product and the sale of their product in future seasons

PROJECT APPROACH INCLUDING ACCOMPLISMENTS

Website and Social Media Our **Facebook** page was improved and actively used and marketed to promote New Jersey peaches in 2013. We used the site to talk about many peach activities and the status of peach availability during the growing and marketing season. We also tried to highlight all of the markets of grower members; If you check the site in 2013 you probably saw information about your market and peach availability. Every market that is on our website was featured on Facebook all three years. We kicked off heavy usage of our page with a marketing push in April 2013 and our peak month of usage has been in July and August for the three years in use. We exclusively talk about peaches and peach activities on our Facebook page. People were reading or talking about peaches on our page. Usage was high in August and September and by season end we had reached 8,807 people on Facebook in 2013, this increased to 15,010 in 2014 and 17,000 plus readers in 2015(season is not complete).

A **Twitter** account was opened and used but not heavily promoted in 2015 so usage was less than in 2014. We 128 followers on **Twitter** in 2103 and 154 in 2014 and have decided it take too much time with little payback on promoting peaches. We invested little time on this in 2015

Three peach videos have been produced and edited. They are posted on **U Tube** and our peach web site at **www.jerseypeaches.com.** One hundred and fifty copies were printed on DVDs of each and were sent to key members and prospective peach buyers. Much of the raw footage for future use.

We updated and revised our website www.jerseypeaches.com and continued to do that for the term of the grant. Everyone who is a member is listed in our site. All grower members who sell peaches are listed with their web site, Facebook, or email. We provide all types of peach information on our site. Our NJ Peach Buyers Guide is published on our site. Editing and placing all this information and updating it annually has been quite costly. We had 410,387 total hits in 2013 compared to 222,548 in 2012. However in 2014 we saw a drop off in visits to our

site to 232,737 in 2014. We have not finished 2015. We need to redesign the appearance of our site to make it more interesting in addition to updating all information. Funds were exhausted in this grant to complete this in 2015. Most of the information on peaches that is in our buyers guide produced from non-grant funds is also listed on our site.

All of these forms of social media have really helped us get more information and exposure on peaches and local Jersey Fresh peaches. We have no data other than the information we get in writing and verbally as well as the tracking information previously reported on our social media programs.

We did transfer $1200(20%) from Retail Promotion to continue to upgrade our web site and finish the new video in 2015.

(2) **Trade Advertising.** We focused on the publication the Packer, Produce News, and the Produce Business magazine. Produce News cost us $3,215 to reach approximately 13, 600 people involved in the produce business. We were also privileged to appear in 11 articles in the paper. Produce Business magazine display advertising (see ad) cost us $3,669 to reach approximately 12,500 circulation. We were privileged to appear and talk about peaches in three articles in the magazine. We worked with NJDA and other commodity organizations to publish a special supplement to The Packer. The supplement had an ad and two articles on NJPPC. It reached a circulation of 13,000 people. We had 400 additional copies printed for distribution at trade shows by the NJDA and our directors. We used all of the funding budgeted for this line. There was only weak to fair demand for peaches and we were unsuccessful in getting buyers to purchase local Jersey peaches in September. Many were dumped or given to Farmers Against Hunger food program

We exhausted our funding in 2013 so no advertising from funds in this grant were used in 2014 and 2015, No money was spent out of this grant in 2014 as all fund were expended in 2013. Information was covered in the first annual report submitted in February 2014.

(3) **Retail Promotions -** Annual visits to produce directors were limited were reduced in 2013 but all known buyers for supermarkets and produce distributors were contacted by email and mailed information irregularly about the quality and availability of NJ Peaches. Most received copies of the video and the Peach Buyers Guides. Growers and other marketers with retail outlets, and in community farmers markets were visited, called or contacted electronically to receive the buyer's guides, the new peach videos and other point of sale material.

Additional funding funds was be expended in 2015 to increase peach promotional events in supermarkets retailing fruit. We attended retail food conventions of the Eastern Produce Council to garner potential buyer information and meet new people involved in retailing peaches. We reached out to our established lists and the new people via email, text messages and phone calls to generate more interest in promoting peaches. We mailed and handle requests for point of sale material and buying information. We mailed and distributed our new videos on merchandising and buying New Jersey Peaches. Our marketing consultant visited wholesale buyers and set ups some in store promotion with stores that had dieticians to promote the health benefits of peaches. Peaches were sampled and a fact sheet was written and distributed on the health benefits of peaches.

Because we always have difficulty meeting and working with buyers in person we received permission to transfer $1200 to the social media line to help with web page updates and to complete our videos.

(4**) Press Releases** - were written and mailed to print, broadcast media and social media. The primary content focused on Peach Promotional Parties; other events calendars; peach pie contest; new tree plantings; updates on social media; crop conditions; promotion planning; new board members; new videos; peach season start; etc. The print, broadcast, and editorial media wrote or broadcast 59 editorial mentions and features on peaches or peach issues that reached a total readership/viewership of 5-million or more. There were some excellent articles on peaches in magazines like Edible Jersey that focused on New Jersey peaches. Most of the information also included recipes and how to use peaches. These were triggered by our press release program. All funds were exhausted in this line in 2013. Twenty one releases were distributed to print, broadcast media and social media postings in 2014. These covered various events, with complete listings and calendars of peach events, listed by date and by county, so that media could print those events occurring in their coverage areas (reporters liked this). Sixty five media mentions were release generated & referenced; 24 came from personal media contact; and 6 printed our press releases in full. Jersey peaches garnered 13 segments on TV (Fox, ABC, NBC, Comcast News, News 12) Total readership/viewership reach was conservatively 8-10-million 2014. No funds were available from this grant for press releases in 2015.

(5) **Special and Market Promotions** - We had a very successful years of our special promotional events called "Peach Parties," held at farmers markets, supermarkets, and restaurants with the purpose of marketing and promoting Jersey-grown peaches. Peach Parties have expanded to year's 35, at farmers markets, restaurants, u-pick markets and farm road stands. Venues involve; creative displays, holding peach events, with tastings, peach pies and pastries, children's stories and games, drawings for baskets of peaches, peach face-painting, peach-pie contests, special pricing, and more. Events have built definite shopper awareness and spurred demand for our Jersey-grown peaches and nectarines. Examples of some unusual events were:

●*Hammonton Farmers Market brought back past Peach Queens from the 40s-60s to meet the2013 New Jersey State Peach Queen selected at the New Jersey Peach Festival;*

●*Chatham Borough conducted a special contest at their community farmers market and crowned 2 peach queens—a child & a high-school student;*

·*Terhune Orchards offered a workshop on using peaches including canning and freezing peaches;*

●*Alstede Farms Peach Festival featured pick-your-own peaches, homemade peach ice cream, slushies, pies, and other peach desserts, and a Sunday peach breakfast;*

●*Collingswood Farmers Market held a peach cooking demonstration and kick-off to its 3-night restaurant promotion of peach menus;*

●*West Windsor Farmers Market held a "little chefs" cooking lesson of the interesting events.* Each of these events and all peach promotional parties generated a lot of free press for peaches in 2013 and part of 2014.

The *Perfect Peach Pie"* recipe contest for amateur bakers *(We had an individual line for the Recipe contest but combined it with the special market promotions in most instances because we had volunteers to judge and run each of these events and most visited these events also*.) was

held at nine designated farmers markets throughout the state in July and August. One winner from south Jersey was selected during Fox TV's *Good Day* in Philadelphia, and a north Jersey winner was selected at the Viking Range Cooking School in Fairfield. The north Jersey winner then went on to demonstrate her pie-making on WPIX, Channel 11 TV *Morning Show*. This eight-minute segment also included an interview with Consultant Pegi Adam on the distinctiveness of Jersey peaches. The balance of funding in this budget line was use to write press releases to promote these events and peaches.

We added 10 community farmers markets and farm markets to our list of promoters in 2014 and 2015 to the promotional peach parties. . We also had 80 entries in these two years to the peach pie contests.

The funding in this line was used to pay our public relations consultant who developed and coordinate all special media events, including August as New Peach Month in New Jersey; some cooperative events cooperative events with the New Jersey Restaurant Association on the Farm to Fork program and other on farm food sampling. This included sourcing quality peaches. The consultant also coordinated these activities with the New Jersey Department of Agriculture participating in the Eastern Produce Council promotional event and coordinating the fruit experts with the Rutgers New Jersey Agricultural Experiment Station and industry at market promotions. The consultant also coordinated and staged visits by the New Jersey State peach Queen during the summer of 2014-2015.

(6) **Consumer Advertising** - New ads were created with QR codes by an advertising agency for the following publications in 2013. A consultant was solicited competitive prices and selected the best, and placed the ads in 16 Print outlets. They carried NJPPC ads, 2 radio stations blurbs, 2 magazines ads, covering all New Jersey and eastern PA. Combination internet banners ads were also selected and used.

Total Audience Reach	**21,070,664 circulation**(13 Print Outlets; 2 radio stations)
Total Cost:	**$26,713.94**
Philadelphia Inquirer	482,457 circulation
Star Ledger Inside Jersey	100,000
Star Ledger, 9/13, 18, 19 +website	229,255
Bergen Record, Herald News 9/13	132,558
NY Daily News Suburban, 9/13	500,000
Edible Jersey	40,000 copies 250+ distribution sites; 140,000 readers
News Transcript	38,861
Independent	31,121
East Brunswick Sentinel	31,047
Princeton Packet Time Off Princeton Packet Time Off, 9/12,9/13	70,000
Wayne Today	19,548
Sussex Aim	10,087
Suburban Trends	9,333
Millennium Radio 11 station	1.4 million weekly

Greater Media Radio - 3 stations	700,000 weekly
Millennium Radio-11 stations	1.4-million weekly
Greater Media Radio-3 stations	700,000 weekly

All funds were exhausted from this grant in 2013 so no funding was available for 2014 and 2015

(7) **Print Materials -** A consultant with the NJ Peach Promotion Council, wrote and printed 50 new banners offered for sale and distributed to all possible venues selling New Jersey peaches. These were offered by email, on our web site, and press releases to the produce trade publications.

NJPPC also reprinted the trifold recipe brochure "Just Any Peach" and distributed 15,000 of these as well at the peach recipe brochure from previous USDA grants All funding was exhausted after the printings in 2013. Most were distributed in2013 but many also in 2014, and 2015.

(8) Marketing Impact Research A consultant was used in August and September 2013 and 27 markets were visited in southern, central, and northern New Jersey to evaluate peach merchandising and promotional activities of each stores. The survey showed that 85% of stores had local NJ Peaches after Labor but 10 days later it dropped by 50% even though many peaches from NJ were still available. The size of the display and the variation in quality were very striking. Displays tended to be smaller and quality was low.

Our consultants visited 24 large retails stores across New Jersey to late August and Early September in 2014. Our New Jersey Peach Crops matured later in 2014 although the volume was down from 2013 when our crop matured early. In our 2014 visits and survey of stores and growers shippers we were pleased that late season peaches moved well and sold at profitable prices. This was in sharp contrast to 2013. Most stores promoted late peaches from New Jersey after Labor Day and throughout the first 3 weeks of September, although though there were still a lot of southern peaches and California peaches (our main competition) in the stores. We feel 2014 was a successful season and that our emphasis on promoting Jersey Fresh, Local and New Jersey Peaches is making an impact on wholesale buyers, retailers and consumers.

We also completed the market impact research with Farleigh Dickinson University. The NJ PPC poll of 801 registered voters in New Jersey was conducted by telephone with both landline and cell phones from September 1 through September 7, 2014, and has a margin of error of +/-3.5 percentage points.

The statewide poll of registered voters in New Jersey found nearly half (47%) have purchased a New Jersey peach during the summer of 2014. More individuals from Central (49%) and South New Jersey (58%) reported buying New Jersey peaches than did those from the Urban Core (37%). Women (54%) are more likely than men (41%) to have purchased New Jersey peaches. New Jersey peach season, which typically runs between late June to early September, got off to a slightly later than normal start this year.

New Jersey residents are equally as likely to have most often purchased a New Jersey peach from a grocery store (36%) as a farm stand (33%), however where in the state one resides plays a significant part in this. Those from the Urban Core are more likely to have purchased at a grocery store (50%), compared with only 23 percent of those in the South and 32 percent of those in the Northwest saying the same. Those from the South (44%), Northwest (42%), Central (40%) parts of New Jersey are more likely than those in the Northeast (18%) or Urban Core (15%) to cite buying NJ peaches at a farm stand

Despite the NJ PPC's limited consumer advertising budget, a quarter (24%) recall seeing or hearing advertisements specifically for New Jersey peaches in media other than store signage. A higher percentage of those in the South (36%) than the Urban Core (18%) or Central (23%) recall seeing or hearing ads for NJ peaches. Overall, most (48%) report having seen the ads in newspapers and magazines

Finally, there is limited awareness and use of the jerseypeaches.com website. Only 2 percent of all individuals have visited the site in the past 12 months.

All funding for Market Impact Research was exhausted after the 2014 marketing season

(9) New Product Research – We are contracting work with our Technical Consultant who contracted work with the Rutgers New Jersey Agricultural Experiment Station and their Post-Harvest Laboratory at the Rutgers Research and Extension Center near Bridgeton, NJ. Our technical consultant has been working with a series of novel new peach varieties originating from their Rutgers NJAES fruit breeding program. The studies are focused on determining how to best harvest and handle these novel varieties when they are being marketing and through the distributions channel. Our growers are producing Gloria (yellow-fleshed) and Scarlet Rose (white fleshed) two newer varieties developed by the Rutgers NJAES. The varieties are extraordinarily attractive, very firm, and slow to soften under normal handling and distribution conditions. We have determined that because of this we are seeing some unusual browning in the flesh we they are handled normally. Our research has developed protocols to reduce this.

Unfortunately the winter of 2014 was one of the coldest winters in 21 years at this site and actually throughout much of New Jersey. Buds were damaged on many of the trees in this block as determined by an evaluation at bloom time. Trees were pruned and sprayed and then a spring freeze occurred in mid-April. After this freeze in mid-April there were still some live flowers that set fruit, this remaining fruit started to grow and size but a hail storms struck the orchard in late June after the trees had been maintained for possible harvest. Near harvest season we concluded that with the limited amount of fruit and the badly hail damaged fruit that it was useless to try and harvest any remaining fruit for evaluation and post-harvest studies.

In 2015 we were able to harvest a lot of fruit of these varieties as well as standard ripening peach varieties. We also for the first season had some of the very new novel varieties fruit that have not been commercially propagated. In 2015 our technical consultant was able to collect samples of all of these fruit and evaluate them. His report on most was reported to council directors. Those harvested were taken to Rutgers in Bridgeton in accordance with their agreement and protocols were evaluated in the post-harvest laboratory. We know the work was done but we have not received the final report pending publication and funding from other sources also. The funds in this grant for new product research were expended and we hope to have full details soon.

GOALS AND OUTCOMES ACHIEVED

We have described in fair detail the activities we accomplishment of the grant funding reporting period you have just read.

We had 410,387 total hits in 2013 compared to 222,548 in 2012. This represents a 46% increase exceeding the 20% targeted increase.

The total 2013 trade advertising audience featured a circulation of 21,790,664 through 13 print outlets and two radio stations.

Distribution of the Wholesale Buyers Guide in 2012 was 1150 and increased to 1200 in 2013. This effort was in addition to the posting of the guide on the NJPPC website.

The NJPPC increased peach promotion events at festivals and retail markets from 21 to 35 from 2013 to 2014.

Annual visits to produce directors were limited and reduced in 2013 and replaced by e-mail and traditional mail updates which reached all known buyers for supermarkets and produce distributors throughout the 2013 season.

Press Releases were written and mailed to print, broadcast media and social media. The primary content focused on Peach Promotional Parties; other events calendars; peach pie contest; new tree plantings; updates on social media; crop conditions; promotion planning; new board members; new videos; peach season start; etc. The print, broadcast, and editorial media wrote or broadcast 59 editorial mentions and features on peaches or peach issues that reached a total readership/viewership of 5-million or more. There were some excellent articles on peaches in magazines like Edible Jersey that focused on New Jersey peaches. Most of the information also included recipes and how to use peaches. These were triggered by our press release program. All funds were exhausted in this line in 2013. Twenty one releases were distributed to print, broadcast media and social media postings in 2014. These covered various events, with complete listings and calendars of peach events, listed by date and by county, so that media could print those events occurring in their coverage areas (reporters liked this). Sixty five media mentions were release generated & referenced; 24 came from personal media contact; and 6 printed our press releases in full. Jersey peaches garnered 13 segments on TV (Fox, ABC, NBC, Comcast News, News 12) Total readership/viewership reach was conservatively 8-10-million 2014. No funds were available from this grant for press releases in 2015.

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The period 2013 to 2015 was an interesting time to study the impact of promotional program on the moment of NJ peaches. We are confident based on previous funding from various sources including previous USDA and NJDA SCBGrants that we have to creatively promote our product to maintain our positon in the market place. We know from past experience and our own surveys that the highest % of our crop is marketed to and through retail food or supermarkets that are more and more centralized in their buying and retailing practices. Even though there is tremendous information on the benefits in buying local and promoting the health benefits of eating more and more fruits and vegetables we have to get these buyers to keep focused on New Jersey peaches. It is too easy to buy peaches from other states and call them local. There all also more and more other produce items on shelves in these stores. We have redirected our promotional to differentiate our product and emphasize its freshness other, local origin and health aspects over items that are of increasingly better quality and more affordable.

In 2013 we had an early season of peach maturity but so did our competitors. Peach movement was slow and demand low because we were always competing with low prices from other states even though we are local, Jersey Fresh, nutritious, delicious and affordable. Our marketing surveys showed that we had nice in-store peach displays until and through Labor Day but then supplies dwindled rapidly. Growers/marketers were not happy with the affordable prices but at least we were able to sustain movement by promoting our product.

In 2014 peaches bloomed much later as they did with our southern competitors. Prices and movement started out strong but peach quality was variable due to excessive rain. We also had a very cold January and some spring low temperatures during bloom that injured buds and flowers in various stages of development. We also had a growing season hail and wind storm that

damaged a significant amount of our fruit after we had started harvesting. All these factors combined to make our midseason and late crop lighter. The peach season ended with many peaches available after Labor Day and retailer shy on promoting the crops because of poorer quality of the fruit. Movement and price returns were variable to growers based on the size of their crop and the late season quality.

2015 was a much better season for New Jersey peach growers and marketers. Although final 2015 data is not yet available fruit movement was good, demand strong and prices higher than 2013 and 2014. Once again we had low winter temperatures in January but growers were better prepared after the first cold winter in 20 years the previous year. Damaged occurred to some tender varieties but bloom was on a normal date and without any frost crop load was good with less thinning cost incurred. With a wet spring and early summer earl season size was good but surprisingly fruit maturity was early. When the most important varieties started to ripen it the rains ceased and fruit flavor was exceptional.

In all years the promotional programs we ran as documented in the narrative had a positive impact on sustaining our peach industry and promoting good quality, movement, generating demand and improving prices.

The USDA NJASS recently provided the following preliminary report on peaches for 2014: "Peach production is estimated at 22 thousand tons, up 21 percent from 2013. The yield per acre is estimated at 4.78 tons, up 0.75 tons from 2013. The value of utilized production totaled 27.3 million dollars, up slightly from 2013."

The final USDA NJASS data for 2015 will be available in early 2016. We do know from our oral survey with growers and retail and wholesale marketers than peach movement, volume sold and prices were better in 2015 than in most years. Our USDA Market News service that monitors volume and movement in wholesale markets also has verified this with their data.

BENEFICIARIES

- How many peach growers, packers, shippers, etc. benefitted from this project? The last data we have is that in early 2015 we had about 75 peach producers as members. There are about another 6 that are shippers that do not produce peaches. We have 80 members that include allied industry members and wholesaler and distributors. This does not include another 50 that are not our members. There are probably another 500-100 that work for all these people that may benefit from the accomplishments and viability of our peach industry

- Approximately how many consumers of peaches? The best data we have on this is on page 6 on the research done by Fairleigh Dickinson. We don't have any better consumer data other than the 21,200,000 we reached with our advertising

- The environmental impact may have resulted in increased growth in the peach industry – how might that be demonstrated in terms of potential economic impact? The value of utilized peach production in 2014 was $27.5 million dollars. I am confident this was up at least to $30 million in 2015 although these final figures are not yet available form NASS. This is the wholesale value so the

retail value is at least double that or $60 million dollars. Our biggest environmental impact it the trees and open space we preserve which offer many many benefits to a densely populated urban state.

The beneficiaries of our program with this grant were not only the peach growers, packers, shippers and other marketers of New Jersey but all the allied industries serving the industry and the business marketing peaches through the full distribution channel. Farm labor that plants, grows, prunes, thins harvests and pack and stores NJ peaches are benefited by having jobs in NJ. Many peach farmers and marketers also grow other crops and are integrated into other business they could not sustain without growing peaches. Consumers benefit from having a viable tree fruit industry. Trees produce oxygen. Orchard land collects rainwater to help recharge our aquifers. Peach farms prevent soil erosion on sloping land by planting trees and mostly sod middles Tree farms provide habitat and food for wildlife even though their populations must be controlled to prevent damage. Peach farmers like many other farmers and foresters preserve open space for the beautification of the Garden State.

Peach farming benefits consumers by providing a local Jersey Fresh, nutritious, and delicious peaches. Their farms preserve open space that is a tax benefit to their communities. They demand less municipal service than the property tax they pay, off-setting the imbalance that occurs with developed land in commercial and residential housing.

LESSONS LEARNED

1) We will never be able to raise enough money to really make the impact we would like to improve the sustainability of the NJ Peach industry.
2) Many of the best specialized services and consultants cannot be employed because of the small amount of money we raise;
3) We continue to have limited influence with buyers for large multistate food retailers because of the price and services they demand to buy and promote NJ peaches. We simply do not have enough manpower or other resources to compete with large grower shippers from other states like California, Washington and the southeastern states.
4) The lack of funding in the Jersey Fresh program and other cooperating departments and agencies in the state has hurt the support we need to promote NJ peaches. We need Jersey Fresh promotion from the NJ Department of Agriculture we need educational support and research from the Rutgers NJAES. The reduction of support has hurt our promotional program.
5) In spite of all the work we put into developing and delivering promotional programs we will never have the impact that the environment has on the price of NJ peaches. Temperature, date of bloom and development, rainfall and the increased frequency of violent wind and hail storms all have a profound impact on the success of our promotional program.

ADDITIONAL INFORMATION can be provided if needed. The report is already too long.

CONTACT PERSON(S)

Applicant: New Jersey Peach Promotion Council (NJPPC)
Address: 800 Ellis Mill Road
Glassboro, NJ 08312
info@jerseypeaches.com or www.jerseypeaches.com

Contact: Santo John Maccherone
Phone: 856-207-4542
Fax: 856-878-0404
Email: circlemfarmsllc@gmail.com

Additional Contacts;

Jerome L. Frecon
Professor Emeritus, Rutgers University
and Horticultural Consultant for
125 Trent Road
Turnersville, N.J. 08012
Email; jfrecon@verizon.net
856 207-7123

Pegi Adam,
Public Relations Consultant -
Writer, Media Relations, Marketing Communications, Promotions
13 The Fairway
Montclair, NJ 07043
973-744-6090
pegi@mountsnow.org and pegiadam@verizon.net

Agreement # 12-25-B-1476
Final Performance Report
April 18, 2014

Trenton Farmers Market

Project Title:
"Jersey Fresh Days at the Trenton Farmers Market"

Project Summary;

Using the Trenton Farmers Market as a well-known local marketplace the purpose of the project was to stimulate consumer interest in and demand for locally produced specialty crops and to also increase consumer traffic through the market with a goal toward increasing demand for locally produced specialty crops.

The promotion was timed to coordinate with the local availability of specialty crops and to maximize consumer knowledge of product availability during the short marketing season for the featured specialty crops.

Our goal was a continuation of our 2012 SCBG Grant which also was to promote Jersey Fresh Fruits and Vegetables and to continue to entice customers to buy and eat local.

Project Approach;

We stated that we would hold six Jersey Fresh days here at the Market when in fact we were able to sponsor nine such days. Our first Jersey Fresh Day was held on June 1st…Jersey Fresh Strawberry Day where we offered a delicious piece of cake topped with whipped cream and Jersey Fresh Strawberries. We served 1,000 desserts, compared to serving 750 desserts in 2012. The increase was 33.33%. We exceeded our objective which was to increase desserts distributed by 15%. There is no question that the additional advertising did provide the additional exposure we were looking for! Weather conditions for the day were perfect in that the temperature was in the 90's, it was clear and sunny.

Next was Jersey Fresh Blueberry Day held on June 28th with patrons being treated to a delicious piece of cake topped with whipped cream and Jersey fresh Blueberries…serving 750 desserts. This number was the same as last year. The reason for a lack of increase in desserts served was most likely due to the fact that the Jersey Fresh Day was held on a Friday rather than a Saturday when traffic in the Market is less. Weather conditions were warm, sunny and temperatures in the 90's.

July 20th featured Jersey Fresh Sweet Corn Day and approximately 950 ears of cooked Jersey Fresh Sweet Corn were served to customers with ample supplies of butter, salt and napkins. This was an approximate 6% increase as compared to the number of ears served in 2012.

Next was Jersey Fresh Melon Day serving approximately 900 samples of Jersey fresh Melons including watermelon, cantaloupe and honeydews. This number is about 100 less than last year with again the reason being it was held on a Friday rather than a Saturday where traffic is lighter.

August 17th featured Jersey Fresh Peach Day which was a huge success serving 1,200 desserts which consisted of a piece of cake topped with whipped cream and Jersey Fresh Peaches. This number accounted for a 50% increase over last year where only 800 desserts were served. Weather conditions were most comfortable with temperatures in the 80's.

On August 30th we added a day not in our original proposal and that is Jersey Fresh Tomato Salad Day which consisted of sliced Jersey Tomatoes with olive oil, basil and fresh mozzarella cheese. Approximately 500 desserts were served which is a 25% increase over last year.

Another Day that was added and not included in the original proposal was Jersey Fresh Pepper Day held on September 20th. A variety of Jersey Fresh Peppers were served with olive oil, balsamic vinegar, pepper and feta cheese. Approximately 625 Pepper Salads were served on a very comfortable day in the 80's and clear! This was the first time we have undertaken A Pepper Salad Day and naturally there is no comparison to make with past years only that it too was a very successful undertaking and we will certainly look to do it again!

Our final Jersey Fresh Day was Jersey Fresh Caramel Apple Day where customers were treated to a cored and sliced apple served in a bowl, topped with warm caramel and if they liked crushed peanuts were placed on top. Approximately 900 desserts were served as compared to last year where 850 were served, thus an increase of about 6%. Temperatures were in the 70's and clear!

Our Grant application stated we would conduct six cooking demonstrations when in actuality we were able to do seven. The first was held on June 6th and featured Strawberry Bruschetta with goat cheese and fresh bread. Our second, held on June 20th, featured Jersey Fresh Green Salad with Roasted Beets and Feta Cheese in a Honey Red Onion Vinaigrette. June 27th was our third cooking demo and was entitled Blueberry Gazpacho. Our fourth cooking demonstration held in July featured Zucchini Bread. July 18th was a huge success featuring Jersey Fresh Summer Dishes and the presenter was Dennis Malloy of Radio Station 101.5FM. Dennis is featured daily on the station from 10AM to 2PM and the show is entitled "The Dennis & Judy Show"…extremely popular and he was able to draw a great audience. This was our fifth demo. Our sixth demo featured a renowned chef from a local restaurant and the dish served and being demonstrated was Jersey Fresh Peaches, Pork Chops and Gorgonzola Cheese! The demo was held on August 29th. Our final cooking demo was held on September 5th and featured Jersey Fresh Ratatouille with fresh bread!

All cooking demos provided our customers with FREE SAMPLES as well as FREE COPIES OF RECIPES. We were also able to post the recipes on our website for all to see! Nonetheless all were most successful and provided our customers with not only a FREE taste but the opportunity to purchase the ingredients here at the Market and the recipe for them to create their own masterpiece at home for their families…a win, win!
As stated in our Grant Application the Market is comprised of now nine farmers. All of them are family operations and support in most cases themselves as well as their children and in some cases their grandchildren. Our "Jersey Fresh Days" and Cooking Demonstrations gave their crops added attention and certainly was an enticement for customers to purchase these crops and attempt to utilize them as demonstrated in all the free samples distributed. In short it was a win, win for farmers and customers…farmers financially and customers health wise in that they are buying and eating local…Fresh, Fresh and Fresh!

Our very generous farmers donated all the necessary fruits and vegetables for each of Jersey Fresh Days. Thousands of dollars in fruits and vegetables were donated by our farmer members.

Advertising for each of the days was done in combination of radio and newspapers to attract customers to each of our Jersey Fresh Days. Hostesses were hired and paid out of the Grant

money. All days were posted on our website and face book as well as posters well in advance of each of the days posted on all six entrances to the Market.

The same was done for all cooking demonstrations and again our farmer members were most generous in providing the necessary ingredients for each. The total farmer contributions would be thousands of dollars in fruits and vegetables for both the Jersey Fresh Days and the cooking demonstrations!
To facilitate the sampling and cooking demonstrations of specific specialty crop commodities some non-specialty food items such as bread and cheese were served as sampling vehicles, or complimentary items, to show that consumption of specialty products need not be confined exclusively to being served or presented as singular foods which can only be served as single course meals or as a solitary stand-alone snack items. In compliance with strict USDA guidelines those complimentary items were never promoted in any manner, or intended to be presented in any manner, which might possibly be interpreted as a promotion of those complimentary non-specialty crop items. Those items were served with no intention other than being utilized as non-promoted generic non-specialty crop food items being utilized for any other purpose than to solely enhance the competiveness of the specialty crops which accompanied them.

Goals and Outcomes Achieved;
As stated earlier percentages were attached to the various Jersey Fresh Days other than those that were held for the first time. All in all increases were shown and the fact that we were able to add additional days and serve additional FREE samples to entice our customers to buy and eat local, we feel the project was successful and that our goals were achieved. We are certain that our nine farmer members saw an increase in their sales of the respective commodities that were promoted. There is no question that on Jersey Fresh Days traffic at the Market did increase by at least 15%!

The market manager interviewed each specialty crop grower to conduct a survey to establish a benchmark for normal customer traffic on weekend days not featuring special Jersey Fresh Days. The nine participating growers estimated that average customer traffic from 10 AM to 3 PM on non-Jersey Fresh Day weekend days were about 350 shoppers.

Following the promotion the market manager conducted a verbal survey of the nine participating specialty crop growers to determine and estimate of the number of shoppers visiting the market on weekend Jersey Fresh Days from 10 AM to 3 PM. The post project estimate was that about 530 shoppers came through the market on weekend days featuring Jersey Fresh Days. This represents the increase in customer traffic on Jersey Fresh Days to be about 50%.

The 50% increase in customers during Jersey Fresh Days, as opposed to non-Jersey Fresh Days, greatly exceeds the targeted goal of increasing customer traffic on those days by 15%.

This is a measurement of the estimated increases in foot traffic through the market and it not intended to make a direct correlation to an increase of sales to the number of samples provided.

Beneficiaries;
Once again the beneficiaries include the Market's farmer members who grow and sell their fruits and vegetables here at the Market. With emphasis on the various commodities that were featured on each of our Jersey Fresh Days. Secondly, our customers who had the opportunity to sample the various specialty crops that were offered FREE during each of the Jersey Fresh Days as well as the FREE samples that were offered at each of our Cooking Demonstrations. Hopefully those very same customers who enjoyed the samples went on to purchase, eat and enjoy Jersey Fresh. Their support and buying local was beneficial to our farmers and their eating Jersey Fresh was a healthy plus for them and their families!

The primary specialty crop benefactors from this project were the nine specialty crop grower/members of the Trenton Farmers Market. They benefited through increased customer traffic resulting increased sales and in other equally important but less tangible ways.

The general public and regular customers of the Trenton Farmers Market make an effort to bring higher percentages of children to the Jersey Fresh Days in comparison to a normal day at the market. This is one of the intended benefits of the Jersey Fresh days is to provide an opportunity for intergenerational sharing of a knowledge about and love for locally grown nutritious specialty crops. The promotion of the family friendly activities and sampling of specialty crops provides a festive environment to create positive images and positive associations as an introduction to local farm products for young people. For the survival of future producers of specialty crops it is essential that today's young people grow up to have a positive image and a continuing demand for locally grown specialty crops.

Sampling of locally produced specialty crops at the Trenton Farmers Market on Jersey Fresh Days can have a season long impact on consumption patterns as consumers travel across the state and down to the shore for the seasonal activities that accompany the specialty crop production season in New Jersey. All throughout the State of New Jersey are hundreds of roadside markets offering similar locally produced specialty crops to those featured on the Trenton Farmers Market Jersey Fresh Days. Those markets offer the opportunity for repeat purchases of the specialty crops sampled at the Trenton Farmers Market and the opportunity to share those products at the peak of their freshness at large family gatherings celebrating the summer season in the New Jersey area.

Lessons Learned;
We think it is imperative to continue what we have started and will continue to do so for this year. Our funds will be somewhat limited and perhaps our promotion will be on a lesser scale, however, we feel it is still most necessary to continue to educate the public on buying and eating local.

Contact Person;
Jack and Marcia Ball
Co-Managers
The Trenton Farmers Market
Tel: 609-695-2998

Email: trentonfarmersmarket@comcast.net.