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Specialty Crop Block Grant
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Final Report

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FINAL REPORT

Project Title: Eat Fresh Maryland: Increasing Sales of Maryland Fruits and Vegetables to Federal Nutrition Benefit Clients at Maryland Farmers Markets

PROJECT SUMMARY

The goal of this project was to increase specialty crop sales to low-income populations throughout Maryland by promoting the competitiveness of specialty crops sold at a minimum of fifteen Maryland farmers markets. This project emerged from awareness of two distinct but overlapping needs: (1) the challenge that specialty crops producers and market managers face in marketing to federal nutrition benefits participants, particularly those using the WIC FVC, and (2) the need to increase fresh, local fruit and vegetable consumption amongst low-income Maryland residents through targeted marketing, education, and financial incentives.

Nationally, farmers' markets are increasingly marketing to federal nutrition benefit clients, recognizing a largely untapped but potentially significant funding stream. A number of federal nutrition benefits programs allow vulnerable Maryland families to shop at farmers markets: the Supplemental Nutrition Assistance Program (SNAP, formerly known as food stamps); Women, Infants, and Children (WIC) and Senior Farmers' Market Nutrition Program (FMNP) checks; and the WIC Fruit and Vegetable Checks (FVC). Implementing programs to reach these customers provides additional access to fresh fruits and vegetables to low-income families, additional revenue for farmers resulting from access to new customers, and improves the availability of fresh fruits and vegetables to neighborhoods with limited access to locally grown produce. Maryland has gained national recognition for its commitment to developing models mutually supportive of specialty crops producers and low-income residents.

However, Maryland specialty crops producers have struggled to access WIC FVC shoppers at farmers markets. WIC FVC acceptance at Maryland farmers markets was piloted in 2010, but was met with extremely low redemption rates; only 1% of total WIC Fruit and Vegetable Checks redeemed in 2010 were used at farmers markets. With an annual cash value of approximately \$11.1 million, WIC FVC is an untapped revenue stream for specialty crop producers. Increased redemption of WIC FVC at farmers markets would boost specialty crop sales for participating farmers and draw federal funds into local economy. This project aimed to support Maryland farmers markets in generating revenue through use of WIC FVC at markets through marketing the program and educating consumers about how to cook with locally-grown produce.

Through the Eat Fresh Maryland network, a collaborative of Maryland farmers market managers, non-profit organizations, and public agencies, this project promoted increased use of federal nutrition benefits, particularly the WIC Fruit and Vegetable Checks (FVC), at Maryland farmers markets. East Fresh Maryland was launched in 2010 with Maryland Department of Agriculture Specialty Crops Block Grant funding. All marketing materials, outreach and technical assistance exclusively promoted specialty crops.

Project objectives included: (1) Expanding Eat Fresh Maryland's multilingual outreach and marketing campaign to increase specialty crop consumption through usage of the Women, Infant, and Children (WIC) Fruit and Vegetable Checks at Maryland farmers markets; (2) Providing financial incentives for WIC participants at seven Baltimore area farmers markets; (3) and Offering technical assistance on federal nutrition benefits at markets for Maryland specialty crops producers.

PROJECT APPROACH

Project activities were developed to address the challenges that have stood as barriers to WIC FVC use at markets. Specifically, maximizing the benefit of the WIC FVC to Maryland specialty crop producers involves a number of technical, logistical, marketing, and financial challenges. Since WIC participants may use their FVC at any grocery or retail outlet for the purchase of fresh fruits and vegetables, a targeted educational campaign is necessary to inform consumers of the benefits of locally grown produce. Eat Fresh Maryland first launched such a campaign in 2011, to positive response from producers and consumers. Additionally, the WIC FVC requires farmers to follow a different set of guidelines than for the WIC FMNP, with which they are already familiar. Support from well-informed market managers is necessary for ensuring that specialty crop farmers meet WIC FVC guidelines and receive maximum financial benefit from this program. Finally, because at the time of writing this grant proposal, the applications for producers to accept FMNP and WIC FVC were separate, Eat Fresh Maryland has worked with and supported the efforts of the Maryland Department of Agriculture to promote WIC FVC acceptance among eligible specialty crop producers.

To address these needs, Crossroads Community Food Network has expanded its Eat Fresh Maryland network, increasing both the number of partners and the scope of programming. At present, Eat Fresh Maryland has signed partnership agreements from 37 farmers markets, plus the non-profit and government partners listed below.

Eat Fresh Maryland partners, defined as relevant entities who have signed partnership agreements, include: farmers markets throughout Maryland; Maryland Department of Health and Mental Hygiene; Maryland Department of Agriculture; University of Maryland Extension, University of Maryland School of Public Health; Maryland Hunger Solutions; Southern Maryland Agricultural Development Commission; and Future Harvest-CASA.

During this grant period, December 2011- July 2013, Eat Fresh Maryland network activities included:

- End of season partners survey, evaluating the first year of Eat Fresh Maryland programming;
- A webinar presenting best practices and challenges to over 110+ viewers nationwide;
- Presentation at Future Harvest-CASA conference in January 2012;
- Development of a marketing and education plan for 2012, including: bilingual materials for distribution at markets and through local WIC offices, healthy eating activities for use at market;
- Development of "Market to Mealtime," a nutrition education curriculum exclusively promoting locally grown specialty crops for use at farmers markets (additional details below);

- February 2012 day-long partners workshop in Takoma Park, MD, offering technical assistance and peer-to-peer learning for 22 attendees;
- A presentation on federal nutrition benefits at farmers markets and Eat Fresh Maryland to all Maryland farmers market managers at the annual Maryland Department of Agriculture's Farmers Market Manager's Conference in February 2012;
- A Future Harvest-CASA field day in Baltimore in March 2012, which included a site visit and informational tour of Waverly Farmers Market and an FMNP/WIC FVC training led by MDA and DHMH staff;
- A second in-person partners workshop in Takoma Park in April 2012, with emphasis on developing and implementing effective outreach plans to WIC participants, building relationships with local WIC clinics, utilization and distribution of Eat Fresh Maryland materials, and effective data collection and reporting.
- Development and implementation of incentive program for WIC FVC at 7 Baltimore farmers markets;
- Weekly WIC FVC sales data reports from 14 partner farmers markets (additional details below) during 2012 season;
- End of season partners webinar in January 2013, with 17 attendees;
- In-person partners meeting in February 2013 in conjunction with the Maryland Department of Agriculture's annual Farmers Market Conference;
- In-person partners meeting in April 2013 in partnership with Maryland Hunger Solutions and the Baltimore Farmers Market Collaborative;
- Presentation on Eat Fresh Maryland's successes at the Wholesome Wave Annual Convening in May 2013;
- Implementation of a revised outreach and marketing campaign during the 2013 market season, with ongoing data collection as in previous years;
- On-going technical assistance to network partners.

The goals and accomplishments of these network activities were twofold: to provide technical assistance and training to Maryland farmers market managers on federal nutrition benefits and specialty crops, and to develop an outreach and marketing campaign to federal nutrition benefits clients, increasing use of federal nutrition assistance dollars to purchase Maryland specialty crops. Both of these aims were successfully met.

Of the programs listed here, the pilot season of Baltimore Bucks incentivizing WIC FVC redemption warrants particular elaboration. Baltimore Bucks is a program of the Baltimore-based non-profit Maryland Hunger Solutions, and was launched in 2010 to increase SNAP redemption at Baltimore farmers markets. In 2013, with Specialty Crop Block Grant funding, this program was expanded to include incentives for WIC FVC at participating markets. SCBG funds were used *only* to match WIC FVC purchases; Maryland Hunger Solutions funded their SNAP incentives with private foundation funding. These funds were carefully separated through close data collection and the following at-market tracking systems.

Because WIC FVC checks are spent directly with the farmer, rather than through a central SNAP/EBT purchasing system, we devised a system to ensure a) that WIC FVC checks were spent and b) the exact dollar amount spent. All specialty crops producers at the participating markets had a stack of pre-made receipts at their stands, pre-printed with the three dollar amounts in which WIC FVC checks are

distributed: \$6, \$10, and \$15. Upon conducting a transaction using a WIC FVC check, the producer would circle the dollar amount of the check and hand the receipt to the customer. The customer would then take the receipt to the market manager’s tent in exchange for a corresponding number of Baltimore Bucks, which could only be used to purchase fruits and vegetables. Through these receipts, Maryland Hunger Solutions and Crossroads were able to monitor the exact amount of Baltimore Bucks distributed to WIC FVC shoppers and budget for the WIC FVC Baltimore Bucks as a separate program from the SNAP incentives.

The primary project partners were Future Harvest-CASA, Maryland WIC, Maryland Department of Agriculture, University of Maryland Extension, and Maryland Hunger Solutions. In addition to participating in network activities, including workshops, meetings, and conference calls, each of the primary partners helped us access their constituents that we identified as target audiences for this initiative. Specifically, Future Harvest-CASA supported farmer outreach through Field Days and promotion to their network; Maryland WIC provided content area expertise in developing our outreach and marketing materials and promoted the initiative to local WIC directors; MDA has provided invaluable support in engaging Maryland farmers market managers, content area expertise, and cross-promotion of network resources; University of Maryland Extension provided expertise and supplemental funds for development of Market to Mealtime in 2012 and assumed primary responsibility for the program in 2013 and beyond; and Maryland Hunger Solutions has assumed day-to-day oversight of the incentive program in Baltimore;

GOALS AND OUTCOMES ACHIEVED

- 1) Increase the number of specialty crop producers trained to accept WIC FVC in Maryland:

In the grant proposal, Crossroads stated its intent to increase the number of WIC FVC trained farmers by 20% from 2011 to 2012. Actual numbers are as follows:

Year	2010	2011	2012	2013
# WIC FVC Farmers in Maryland	2	157	215	252

As this table demonstrates, the number of WIC FVC trained farmers in Maryland increased by 37% from 2011 to 2012, exceeding the proposed goal of 20%.

This goal was achieved largely through partnerships with Future Harvest-CASA and the Maryland Department of Agriculture (MDA). In late January 2012, Crossroads Executive Director Michele Levy co-presented on at the annual Future Harvest-CASA conference, speaking to approximately 30 producers about accepting federal nutrition benefits at farmers markets and introducing the Eat Fresh Maryland network. Additionally, Eat Fresh Maryland and Future Harvest-CASA co-hosted a tour of the Waverly Farmers Market in March 2012 in which specialty crops producers could see federal nutrition benefits programs being redeemed at market and participate in an on-site FMNP and WIC FVC certification. We have also worked closely with MDA and the Maryland Department of Health and Mental Hygiene, which oversees the state WIC program, to support their collaborative efforts to streamline the application and trainings for producers to accept the WIC FVC and FMNP in one, joint, simplified process.

2) Increase Maryland specialty crop sales through redemption of WIC FVC and Eat Fresh Maryland “Baltimore Bucks” incentives:

This grant period spanned two market seasons: the entire 2012 market season, and a portion of 2013. In the original grant proposal, we anticipated that in 2012, WIC FVC redemption at participating markets would increase by 25% over 2011. In 2011, twelve Eat Fresh Maryland partners reported \$4,850 in WIC FVC redeemed from June-October. In 2012, fourteen partners submitted data on WIC FVC sales, totaling \$30,612. This sum reflects a 531% increase in dollar sales from Year 1 to Year 2 of Eat Fresh Maryland activities, reflecting overwhelming and unexpected success of our promotional efforts and the Baltimore Bucks incentive pilot. We attribute this dramatic increase to a multi-tiered marketing strategy over our two years of Eat Fresh Maryland, leading to an increased awareness amongst WIC recipients that they can use these benefits at markets, increased participation amongst Maryland Specialty Crops producers, and increased interest amongst WIC staff in promoting Maryland farmers markets.

3) Successful WIC FVC Marketing Campaign:

With input from partners gleaned through 2011 and 2012 end-of-season surveys, conference calls, and in-person workshops we revamped our branded, bilingual marketing materials promoting redemption of the WIC Fruit and Vegetable Checks (FVC) at Maryland farmers markets to purchase fresh, locally grown produce before the start of each season. Eat Fresh Maryland partners distributed these materials in eight Maryland counties and Baltimore City at farmers markets, local WIC and Department of Social Services offices, senior and community centers, local storefronts, and churches. These promotional materials included:

- English and Spanish color tri-fold brochures explaining how to use WIC FVC at farmers market, listing Eat Fresh Maryland partner markets by county, and containing a seasonality chart listing Maryland grown specialty crops by month;
- English and Spanish WIC at market 11x17 posters to hang at local benefits offices listing address of closest farmers market;
- English and Spanish “WIC Accepted Here!” banners for display at participating farmers markets;
- English and Spanish fliers for distribution at markets and benefits offices;
- Bookmark-sized inserts for WIC packets listing Eat Fresh Maryland markets by county, distributed through WIC clinics in all participating areas.

By circulating a branded, streamlined set of promotional materials throughout the state, we aimed to generate increased awareness amongst federal nutrition benefits clients that they may use their assistance dollars to purchase specialty crops. As the number of Eat Fresh Maryland markets has increased since 2010, the brand recognition has gained greater traction. Name and brand recognition of the Eat Fresh Maryland network serves as a reminder to federal nutrition benefits clients that any location displaying that logo is a site where WIC may be used to purchase fresh, healthy, local fruits and vegetables. Additionally, the development of template materials alleviated the burden placed on individual market managers and farmers to generate materials tailored to their specific market.

4) Implementation of “Baltimore Bucks” incentive program for WIC FVC purchases at participating farmers markets

Even with a successful targeted outreach campaign, the cost of locally grown specialty crops is still prohibitive for many WIC recipients. Access to healthy food involves not only having healthy food available to purchase from neighborhood vendors, but also having the resources to purchase it. As a result, Eat Fresh Maryland piloted the use of financial incentives (“Baltimore Bucks”) for WIC FVC shoppers, targeting seven Baltimore area farmers markets. The program was based on the “double-dollars” model piloted at Crossroads Community Food Network in 2007; the model was so successful that it has since been replicated in approximately 400 markets nationwide.

To launch this program in Baltimore, Crossroads partnered with Maryland Hunger Solutions, a Baltimore-based not-for-profit organization that launched “Baltimore Bucks” in three Baltimore City farmers markets in 2010. For the first two years of Baltimore Bucks programming, incentive funds were only used to match purchases made using Supplemental Nutrition Assistance Program (SNAP, also known in Maryland as the Food Supplement Program or FSP). By year two of Baltimore Bucks programming, Maryland Hungers expanded the successful pilot program to seven markets: five in Baltimore City and two in Baltimore County. Based on the success of this program to date, the programmatic infrastructure that Maryland Hunger Solutions had developed, and awareness of the program amongst producers, market managers, and WIC participants, Baltimore was the optimal site for piloting WIC FVC incentives.

With direction and oversight from Maryland Hunger Solutions, the incentive funds proposed in this request matched FVC at six participating farmers markets in 2012. These markets included: Waverly/32nd Street, Park Heights/Pimlico, Highlandtown, Kenilworth, Catonsville, and Go Life/Cylburn. All of these markets had offered Baltimore Bucks for SNAP purchases in 2011. Before the 2012 season, Crossroads and Maryland Hunger Solutions identified the six Baltimore markets for piloting the incentive program. Staff from the two organizations jointly customized Eat Fresh Maryland marketing materials to specially promote the new WIC FVC incentives, list participating markets, and begin distribution of the materials in those communities. Additionally, staff collaborated on developing training materials for farmers selling at the participating markets, and conducted on-site trainings before the start of the market season. After the program launched, Maryland Hunger Solutions served as primary point of contact for the Baltimore markets offering WIC FVC incentives. Maryland Hunger Solutions was in regular contact with the market managers, helping them monitor funds spent and remaining, promoting the program around Baltimore, and collecting weekly sales data from the market managers, which was in turn reported to Crossroads at the end of each month.

This financial incentive program provided WIC FVC shoppers with dollar-value coupons redeemable at the select farmers markets for the purchase of fresh fruits and vegetables only. Upon spending a WIC FVC check with a certified specialty crop producer, the producer handed the consumer a receipt detailing the dollar amount spent (WIC FVC are distributed in denominations of \$6, \$10, and \$15). The consumer then brought the receipt to the market manager’s tent and received a corresponding number of Baltimore Bucks, eligible for purchase of specialty crops at that market only.

Demand for the program exceeded expectations. In this grant, we were awarded \$4,000 for WIC FVC incentives at seven partner Baltimore markets. One of those seven markets (West Baltimore-MARC) did not operate in 2013, so Maryland Hunger Solutions reallocated the funds amongst the six others. The markets were overwhelmed by interest and participation, and redeemed a total of \$4,328 in WIC FVC incentives (the difference was covered by an outside funding source). All of these dollars went directly

to the purchase of specialty crops from producers at participating markets. Additionally, specialty crop producers at the six markets reported \$6,563 in WIC FVC sales in 2012, a 225% increase over the \$2,911 in sales reported the previous season. Importantly, the discrepancy between reported WIC FVC sales and WIC FVC-specific Baltimore Bucks redeemed resulted from a limitation on funds for the incentives. However, that spending exceeded the match demonstrates that this program generated interest among WIC participants in spending their benefits at farmers markets even without a financial match. These incentives directly boosted sales of specialty crops by: incentivizing Maryland WIC participants to spend their WIC FVC at farmers markets; increasing attendance at the participating farmers markets, leading to greater overall sales; and subsidizing the purchase of specialty crops with dollars that went directly to Maryland farmers market producers.

According to Maryland Hunger Solution's Program Manager, "demand for WIC FVC incentives greatly outpaced the anticipated need in the SCBG budget proposal, which in turn was based on previous seasons' FVC sales. For example, the Highlandtown Farmers' Market expended its allotted \$500 in incentives in a mere 3 three weeks. We estimate that, with the demonstrated need, these six markets could have matched up to \$12,000 in WIC FVC - three times the amount granted." Producers, market managers, and WIC customers expressed tremendous interest in continuing this program.

5) Creation of Market to Mealtime local and healthy food promotional program

As indicated earlier in this report, Eat Fresh Maryland initiated a new project-specific program not proposed in the original grant. In our 2011 partner survey, 56% of respondents noted interest in market-based seasonal eating education. Upon surveying available programs, we learned that while healthy eating curricula tailored to WIC families exist, nothing that we found focused specifically on eating locally and seasonally, and none of these programs were developed for implementation at point-of-sale. Recognizing the opportunity to simultaneously increase sales for Maryland specialty crops producers while potentially increasing local fruit and vegetable consumption amongst Maryland WIC families, we reached out to UMD Extension's Food Smart Team and worked in tandem to develop Market to Mealtime. The pilot season of M2M aimed to increase awareness among market shoppers, with particular emphasis on WIC users, about the seasonal, local leafy greens available to them at Maryland farmers markets and how to incorporate them into the diet through a series of displays, collectable recipe cards, cooking demonstrations, and food tastings at market. All producers selling the leafy greens were given signage indicating that their tent was a site for purchasing the featured items.

The 2012 Market to Mealtime (M2M) pilot was a collaborative effort between University of Maryland Extension and Crossroads' Eat Fresh Maryland initiative. UME funded the development and printing of the materials, the display kits, and items necessary for cooking demonstration. Eat Fresh Maryland worked directly with the UME project manager on the development of the materials, the coordination of the orientation and matching UME educators, who oversaw on-site program implementation, with interested markets/market managers. Maryland Hunger Solutions was an active partner in the implementation of this program as well, setting up the M2M display at seven markets. Because UME was so enthusiastic about working with an existing network of farmers markets managers and generously funded program costs, Crossroads was able to support the development and promotion of this new initiative without drawing on already allocated funds. In 2013, UME assumed primary responsibility for continuing and revamping the program, partnering with Eat Fresh Maryland and the Family League of Baltimore to coordinate M2M activities at markets.

6) Technical Assistance and support for MD Farmers Market Managers

Eat Fresh Maryland provided ongoing technical assistance around increasing WIC FVC redemption to Maryland farmers market managers, growers, and organizations that work directly in support of one or both populations. TA was provided in group settings and one-on-one through workshops, conference calls, site visits, email, and phone calls. See list of Eat Fresh Maryland events in Project Approach for greater detail.

BENEFICIARIES

This project resulted in three primary groups of beneficiaries.

- 1) *Approximately 100 Maryland specialty crop producers selling at Eat Fresh Maryland partner markets* benefited from this project through increased revenue from WIC FVCs and the establishment of a new customer base. By actively targeting WIC shoppers and encouraging redemption of their benefits at farmers markets, this project both generated immediate revenue and cultivated a new population of shoppers who will continue purchasing fresh fruits and vegetables at farmers markets beyond the close of this project. WIC shoppers at participating markets often cited word of mouth and encouragement from friends and family as a significant factor in their decision to use their benefits for locally grown produce. Through continued joint marketing and outreach with the local and state WIC offices, increasing numbers of WIC participants will shift their purchase from grocery stores to farmers markets, generating greater revenue for Maryland specialty crop producers.
- 2) *Approximately 5,000 low-income Marylanders* benefited through access to fresh, local, healthy produce. All participating families were able to procure locally-grown fresh fruits and vegetables using their federal nutrition assistance dollars, purchasing fresher, and more nutrient dense produce than is generally available in supermarkets. Access to higher quality, fresher, and better tasting produce generates greater interest in continuing to purchase locally-grown items, supporting local specialty crops producers, and in increased fruit and vegetable consumption, positively impacting health and wellness. Additionally, as many of the partner markets are located in or near food deserts, this project informed low-income Marylanders that they have the option of purchasing fresh produce within relative proximity to their homes.
- 3) *More than 30 Maryland farmers market and urban farmstand managers* benefited from the support of a network, ongoing technical assistance, marketing support, outreach materials, and signage. Having a centralized entity providing these tools alleviated the burden that would otherwise be placed on individual markets and market managers to develop, fund, and troubleshoot on their own.

LESSONS LEARNED

Evaluation of the second and third seasons of Eat Fresh Maryland highlighted the value of this program and areas for future growth. Primary lessons are as follows:

- 1) *Collaborative, streamlined marketing strengthens farmers markets statewide by minimizing the burden on overextended market managers, many of whom are also farmers and/or operating the market as part of another job.* Demand for this program is evident in the growth of Eat Fresh Maryland, from eight participating markets in Year 1 to twenty-seven markets in Year 3, dramatically exceeding initial expectations. Further, that market managers were willing to

comply with our tedious data reporting requirements without any financial compensation demonstrates that they saw significant value participation in the network, and that their market was stronger from the resources Eat Fresh Maryland provided.

- 2) *Multilingual, branded, clearly displayed point of sale signage is a key tool for increasing sales.* Over the three seasons of Eat Fresh Maryland’s outreach campaign, WIC FVC sales at participating Maryland farmers markets have increased exponentially. Our strategic partnerships with state and local WIC and community organizations have been vital in helping us distribute the materials to WIC participants, inform them that the FVC can be used at farmers markets, and educate them about the benefits and importance of eating locally.
- 3) *Financial incentives are an effective tool for increasing redemption of federal nutrition benefits at farmers markets to purchase specialty crops.* The success of the Baltimore Bucks WIC FVC was evident in both demand for incentives that exceeded supply and in the WIC FVC sales beyond what we were able to match. These data are consistent with nationwide trends, as published by the national non-profit organization Wholesome Wave, indicating the impact of incentive programs on farmers market sales.
- 4) *Low-income households are interested in eating fresh, locally grown produce and are a potential customer base typically overlooked by specialty crops growers.* The data shared throughout this report support our strong belief that low-income Maryland households want to eat fresh, healthy, locally grown foods, and will do so when such foods are made more accessible through education and financial assistance. Eat Fresh Maryland is committed to continuing its work to promote locally grown produce to WIC families, developing outreach models mutually supportive of consumers and producers.
- 5) *Streamlined data collection is essential for evaluating program impact.* The challenge of obtaining WIC FVC sales data from specialty crop growers remained a factor in our second and third seasons of operation. WIC FVC is a paper check based program, transactions occur directly between shopper and producer, rather than through a market manager (as with SNAP sales). Consequently, we are relying both on farmers to self-report to the market managers and on market managers to put forth the effort to collect the information from each individual farmer and then provide weekly sales and transaction data to Eat Fresh Maryland. We continue to dedicate significant staff time to refine and improve data collection systems, working closely with MDA, Maryland Hunger Solutions, and Eat Fresh Maryland partner market managers to verify the accuracy of our data and ensure that our protocol is usable for all relevant parties.

CONTACT PERSON

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ADDITIONAL INFORMATION

Using your WIC FVC at market is simple! Here's how:

1. Find a farmers market close to you at www.marylandbest.net, or ask the staff at your local WIC clinic.
2. Look for farmers with signs that say "WIC Fruit & Vegetable Checks Welcome Here."
3. Choose your favorite fresh fruits and vegetables.
4. Hand the farmer \$10 in the total price on your check.
5. Sign your check, and give it directly to the farmer.

Using your WIC Checks at the market is more than just a shopping trip:

- **Fresh is best!** Foods that have spent less time on the shelf carry more nutritional value.
- **Taste the difference.** Local fruits and vegetables are more flavorful.
- **Put a face to your food.** Meet the farmers who grow your fruits & vegetables. Ask questions about the food you're feeding your family.
- **Enjoy the outdoors.** Farmers markets are a great space for people of all ages to get fresh air and connect with friends. Keep your eyes open for special events, live music and kids' activities.

How to shop at the farmers market:

- Arrive early for the best selection.
- Talk to the farmers for cooking tips, recipes, and information about how the food is grown.
- Bring reusable shopping bags to the market.
- Prepare for the weather. Farmers market stalls are open rain or shine!

Fresh fruits and vegetables you can buy at Maryland farmers markets with your WIC FVC:

- Greens - such as spinach, kale, chard
- Squashes
- Peaches
- Strawberries
- Corn
- Peppers
- Onions
- Apples
- Yams
- Cherries
- Blueberries
- Many many more!

*White potatoes and nuts are not eligible.

What's at market each month? A Seasonality Chart

Produce	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Asparagus												
Beans												
Berries												
Broccoli												
Brussels Sprouts												
Cauliflower												
Cherries												
Corn												
Cucumbers												
Eggplant												
Garlic												
Herbs												
Kale												
Leeks												
Onions												
Potatoes												
Spinach												
Squash												
Tomatoes												
Zucchini												

For more information, go to: www.eatfreshmaryland.org or call (301) 891-7244

USE YOUR WIC FRUIT & VEGETABLE CHECKS (FVC) AT THE FARMERS MARKET!

FINAL REPORT

Project Title: Buy Local-Buy Real Christmas Tree marketing and promotions campaign

PROJECT SUMMARY

The 2011 "Buy Real and Buy Local" project is designed to reverse the trend of decreasing sales and market share for real Christmas trees in Maryland.

Sales of real trees have been declining nationally at a rate of 5 to 7% at Christmas tree farms due to the aggressive marketing of artificial tree producers and the expansion of alternate channels, such as the big box stores like Wal-Mart and Home Depot, for the distribution of real trees.

The project is based upon using a mix of radio and web based marketing to communicate the benefits of having a real Christmas tree from a local farm for the holidays.

The key messages include:

- Buy real not artificial
- Buy local at the farm
- Begin or continue family tradition of a real tree for the holidays

The program will begin the day before Thanksgiving and run through December 19, 2011.

This project will leverage the success of our two previous marketing campaigns in 2009 and 2010 that were also SCBGP funded and successfully allowed us to reverse the trend and actually achieve increased sales of real trees at member farms. The 2011 program will utilize the same marketing channels as in 2009 and 2010 and use complementary messaging to continue expanding the customer base.

PROJECT APPROACH

Beginning on November 23, 2011 we launched a series of 333 targeted radio ads in key market areas across the state combined with web based banner ads, pushdown ads, email blasts and hyperlinked web pages.

Our objective was to have a combined net reach of 1,612,724 consumers during the period, results indicate that we achieved 1,676,367.

Another objective was to achieve increased activity on our association web site to further indicate consumer awareness. Our goal was to realize a 3% increase in overall activity and we realized a 21.5% increase in unique visitors and a 5% increase in the number of hits on our site.

And finally our primary goal was to see increased sales of real trees at the member farms of 3%.

Survey results from the membership show that we achieved an average net increase of 18.6% in sales of real trees and an overall increase in customer traffic of 15%.

GOALS AND OUTCOMES ACHIEVED

The following summarizes our marketing campaign elements for the 2011 program, all elements were successfully implemented beginning on 11/28/2011 through 12/19/2012.

Our goal was to have a net reach of 1,621,724 using a combination of radio and digital web placements, initial results indicate we achieved 1,676,367.

We also planned to achieve an overall 3% increase in sales of real trees and activity on the MCTA web site, we achieved an 18.6% sales increase and over 5% in web activity.

OBJECTIVE	ACTIVITIES PERFORMED AND RESULTS:
Achieve State wide marketing coverage: REACH 1,621,724 CONSUMERS ONE TIME	<p><u>Radio elements:</u> <u>REACH</u> WLIF: 25: 30 SEC ADS M-F 6A-7P 185,078 10: 30 SEC ADS SAT-SUN 6A-7P 85,900 45: 15 SEC ADS M-F 6A-6P 216,400 LITE CHRISTMAS SPONSOR 64,600 780: 10 SEC PROMOS 500,000 LOGO WITH HYPERLINK ON SPLASHPAGE 25,000 PARTNERS PAGE LOGO WITH HYPERLINK 5,000 E-MAIL BLAST TO 12,000 LISTENERS 12,000</p> <p>WWMX: 30: 30 SEC ADS M-F 6A-7P 95,666 18: 30 SEC ADS SAT-SUN 6A-7P 37,300 45: 15 SEC ADS M-F 6A-6P 105,300</p> <p><u>Digital Elements:</u></p>

	<p>40: 30 SEC ADS ON WLIF STREAM 9,160</p> <p>120: 30 SEC ADS ON AOL AND WIAD FM 70,320</p> <p>WWMX HOMEPAGE BANNER WITH HYPERLINK 5,000</p> <p>HOMEPAGE BANNER WITH HYPERLINK 5,000</p> <p>PUSHDOWN AD ON WLIF 200,000</p> <p>NET REACH GOAL: 1,621,724</p> <p>NET REACH ACTUAL: 1,676,367</p> <p>WEB ACTIVITY 139,643 impressions 392 click thrus 0.28% ct rate</p>

<p>OBJECTIVE: ACHIEVE AVERAGE OF 3% INCREASE IN REAL TREE SALES</p> <p>ACHIEVE 3% INCREASE IN MCTA WEB SITE ACTIVITY</p>	<p>RESULTS: AVERAGE INCREASE OF 18.6% REALIZED IN TREE SALES PER FARM, OR 68 TREES AVERAGE INCREASE IN CUSTOMER TRAFFIC OF 15%</p> <p>UNIQUE VISITORS WENT FROM 8308 TO 10093 OR 21.5% SITE HITS WENT FROM 228,169 TO 239,257 OR 5%</p>
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BENEFICIARIES

The primary beneficiaries of the project were the 85 member farms of the MCTA as well as the other non-affiliated member farms that would have also benefited from the marketing campaign to increase demand for real Christmas trees. We estimated that this would be an additional 85 farms across the state.

We further estimated the total economic impact to be in two areas:

1. Increased revenue across all Christmas tree farms in the State of \$411,400 in agricultural sales.

at an average of 68 more trees sold per farm
at an average value per tree of \$50
across 81 actively selling member farms
across 40 actively selling non-member farms
 $68 \times \$50 = \3400
 $\$3400 \times 121 = \$411,400$

2. Keeping farms in farming:

At an average revenue increase of \$3,400/farm, more farms will stay in farming to preserve open land, maintain agricultural revenue stream and provide fun destinations for Maryland families during the Christmas season.

Assuming that this increased revenue will retain a minimum of 5%, we can see 6 to 7 farms maintaining their operation.

LESSONS LEARNED

There is a direct correlation to our ability to communicate the benefits of having a real tree for the holidays and the number of trees sold. The market demographics are in a constant state of flux with the introduction of an ever increasing diversity in our marketplace of differing Christmas and holiday traditions and the changing makeup of the traditional nuclear family. We will need to continually fine tune our messaging and channels of communication to this evolving market.

CONTACT PERSON

Roy C. Eberle
Chief Marketing Officer
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FINAL REPORT

Project Title: Reducing the Barriers Facing Maryland Fresh Fruits and Vegetables Producers in Implementing an Effective Food Safety Program (GAPS)

PROJECT SUMMARY

The Maryland Department of Agriculture's (MDA) Food Quality Assurance Program (FQAP) has conducted Good Agricultural Practices (GAPs) and Good Handling Practices (GHPs) audits for fruit and vegetable producers and handlers through a cooperative agreement with USDA, AMS for several years.

FQAP has also assisted the University of Maryland with providing training sessions to producers concerning GAPs and GHPs. During the audits and training sessions, FQAP identified economic and technical barriers for specialty crop producers trying to implement GAPs and/or GHPs. FQAP was previously awarded specialty crop grant money to address these issues. The purpose of this project was to continue the successful work of previous grants in mitigating food safety risks by reducing the economic and technical barriers to implementing GAPs. This project was important to producers not only to meet the demands of buyers but to also start implementing practices to meet the upcoming FSMA regulations. This project built on previously funded specialty crop grant projects "Good Handling Practices and Good Agricultural Practices (GHP/GAP) Certification Cost-Share Assistance" to provide cost share assistance for certification fees for producers obtaining USDA GAP certification; cost share assistance for implementing GAP practices; GAP training sessions; one to one assistance in writing food safety plans and implementing GAPs; and MDA GAP inspections and certification.

PROJECT APPROACH

With previous grant funding, a dedicated position at the University of Maryland was filled in April 2011 to coordinate GAP training and provide one to one assistance to fruit and vegetable producers. In addition to the formal training sessions and one to one assistance, written materials were developed to assist producers in writing and implementing their GAP plans. These materials were made available to producers at training sessions, on MDA's website and mailed upon request. Feedback from producers and training evaluations were reviewed and used to make the training sessions more effective. The most significant change was to include actual plan writing for the producer's own farm as part of the course. To assist with plan writing both during and after the training sessions, relevant materials were presented on a flash drive. The training attendee was able to save their GAP plan started at the session on the flash drive and have all of the materials necessary to complete their plan at home. MDA also reviewed existing GAP materials and utilized the worker training materials (DVDs and signs) developed by the National GAP program at Cornell. Producers were provided with these so they could train their own employees. Funding from this grant allowed the continuation of training sessions for specialty crop producers; provision of training materials; revisions to the curriculum as the FSMA produce rule evolves and more information is available on best practices; and one to one assistance to producers in developing food safety programs. Training evaluations were developed by the University of Maryland with the use of USDA-NIFA grant #68003-21588 funds. These evaluations were to determine the effectiveness of the training sessions provided with the use of funds from this grant and to establish benchmarks for

future training sessions (see attached evaluations). Evaluation results were also used to make adjustments to the training sessions.

The GAP program geared towards direct marketers and MD farm to school fruit and vegetable producers was developed, finalized and implemented cooperatively with the University of Maryland. The program now includes assistance to producers in meeting the anticipated FDA rule requirements. The MDA GAP program now includes fruit and vegetable producers that need USDA GAP, Harmonized GAP or one of the private GAP certification programs to meet their buyer needs. They are using the MDA GAP as a building block to move on to other GAP certifications. Training sessions offered to specialty crop producers now include a segment on the FDA proposed rule and MDA GAP program requirements have been adjusted so compliance with GAP will also mean compliance with the FDA rule. The audience has been identified as fruit and vegetable producers and notification of the program has taken place through press releases, emails, MDA's website and regional Extension offices. Inspections for MDA GAP now include not only compliance with GAP standards but also verification of compliance with the requirements of the FDA proposed produce rule. Additional adjustments will be made to the program when the rule becomes final. Thirty specialty crop producers were inspected and certified as compliant with the MDA GAP program that included FDA proposed rule requirements with the use of funds from this grant. This is an 85% increase over the 2012 inspections and a 37% increase over the 2013 inspections.

With the use of previous grant funding, criteria and an application process for cost share were developed for the implementation of GAP practices. The program was marketed to potential customers through emails to fruit and vegetable producers and presentations made during GAP training sessions for producers. Criteria established for projects required demonstration that the project would improve food safety. An application and list of examples that could be approved for cost share were developed and distributed to producers (Application and Cost Share List of Examples are included at the end of this report). Specialty crop producers were required to submit an application detailing what they hoped to achieve along with estimates of project cost. Awards were based on each applicant receiving a percentage of their project funded based on the amount of cost share funding available with a cap of \$4,000 per applicant. Applicants were notified of their award amount and were required to submit copies of invoices/receipts prior to cost share being issued. Fruit and vegetable producers received funding for projects that improved the water quality, worker health and hygiene, and packing house sanitation. Nine specialty crop producers received cost share assistance from previously funded grants and two specialty crop producers received funding through this grant to implement good agricultural practices that improved water quality, improved sanitation of harvest and packing equipment, and improved pest control in packing sheds.

Cost share for the cost of USDA GAP or USDA Harmonized GAP audits was provided to three producers for their 2013 audit costs.

The target audience for all programs funded by this grant was notified through postings on MDA's website, direct emails to fruit and vegetable producers registered with MDA's Maryland's Best program, through the Extension offices, development and distribution of a University of Maryland Extension Bulletin and press releases.

The overall scope of this project did not benefit commodities other than specialty crops.

The University of Maryland including Cooperative Extension was a partner in this project and made significant contributions. In particular, they assisted FQAP in planning and presenting training, developing training materials, providing the one to one assistance in writing and implementing a GAP program and notifying specialty crop producers of the project. The University of Maryland also provided funding for the flash drives used for training sessions. The training evaluations were also developed by the University of Maryland with other grant funding.

GOALS AND OUTCOMES ACHIEVED

One of the goals was to increase the number of specialty crop farmers certified/approved by MDA as being in compliance with USDA GAP. Thirty different farmers have become USDA GAP certified during this project. The same farmers do not always become recertified each year depending on crop yield and sales so the number has not increased significantly each year. However, MDA verified all thirty of the farmers have implemented GAPs that meet the USDA audit standards. Thirty specialty crop producers were inspected and certified as compliant with the MDA GAP program. This falls short of the revised goal of one hundred MDA GAP certified producers. Additional farmers have been implementing GAPs and have indicated they will soon request the MDA inspection to verify compliance. MDA expects this number to increase significantly during the next growing season. Through communications with these farmers at training sessions, during the one to one assistance, telephone calls and letters, MDA believes at least 100 farmers are in the process of implementing practices with the intention of requesting the MDA GAP audit.

Another goal of the project was to increase the number of specialty crop farmers that implement Good Agricultural Practices. Two-hundred producers have implemented better worker health and hygiene policies as a result of cost share of educational materials. Seven producers have implemented good agricultural practices related to water quality, harvest and packing equipment sanitation, and pest control using cost share reimbursement from this project.

Two hundred producers have attended training sessions provided during this project. The training sessions provide specific details on improving the on farm good agricultural practices for specialty crop production. It is assumed that most of the 200 farmers attending these sessions have implemented at least some of the good agricultural practices. An additional sixty-eight producers have received one to one assistance in writing a GAP program and successfully implementing the plan.

Two of MDA's USDA licensed GAP auditors left MDA. To replace them, three MDA employees attended USDA's new GAP auditor training in Fredericksburg, VA. These same three auditors also took the USDA Harmonized audit course on line and took additional on line courses to maintain their USDA auditor status. One additional employee received initial training in preparation to meet the demands of increased inspections/audits as a result of the MDA GAP program.

BENEFICIARIES

Over two hundred producers attended fourteen training sessions that were intended for Direct Marketers but attended by both direct marketers and wholesale marketers as they still covered the basics of GAP.

Two hundred specialty crop producers received cost share for worker health and hygiene educational materials used to implement effective employee training programs for good sanitation practices for production, harvest and packing workers. Two specialty crop producers received cost share assistance to implement good agricultural practices that improved water quality, improved sanitation of harvest and packing equipment, and improved pest control in packing sheds. Three producers received cost share reimbursement for USDA GAP audit fees. The beneficiaries have been able to maintain or increase their market share by meeting the food safety requirements of buyers and consumers.

LESSONS LEARNED

Interactions with farmers concerning GAP identified the actual writing of food safety plans to implement GAPs is the biggest barrier. We found that those that attended training sessions frequently did not follow through on actually writing their plan as they found it overwhelming. The training sessions were revised to include a hands-on segment where farmers begin to write their own plan for their farm. This has been a very successful change and has increased the number of producers implementing a GAP program. FQAP has obtained other Specialty Crop grants to assist farmers in writing and implementing GAPs to continue the work of this project. The goal of steadily increasing the number of farmers that are GAP certified was difficult to meet. Although producers implemented and requested USDA audits initially, many did not request in subsequent years as their crop may have suffered significant pest damage, was being sold for processing instead of for the fresh market, etc. A survey will be developed to send producers who attend GAP training sessions but do not follow up to become certified to better understand potential barriers and measure the effectiveness of the training sessions. The survey will include questions to determine why a larger percentage are not following through with certification and what GAP practices they implemented even though they did not become certified.

Initially, FQAP anticipated that once a producer became USDA GAP certified they would maintain that certification each year. The primary reason farmers gave FQAP was there was no sense in spending the time and money for an audit if their buyer was not requiring it or they had little crop to sell (frost or insect damage was cited as the reason for reduced crops to sell). MDA has found that most of these producers continue to follow their GAP program even though they may not request an audit every year.

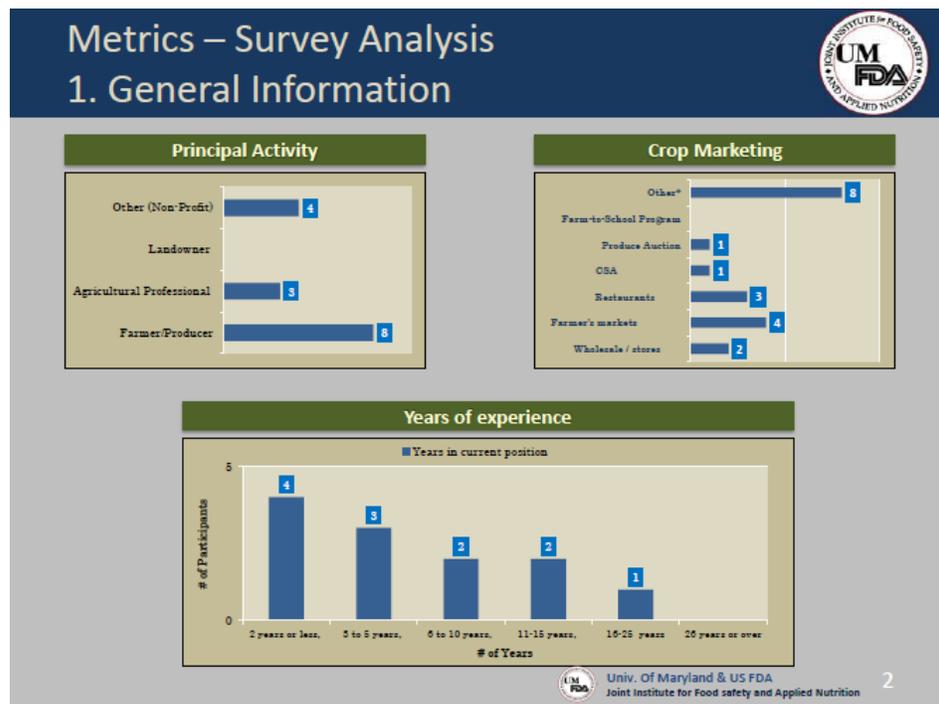
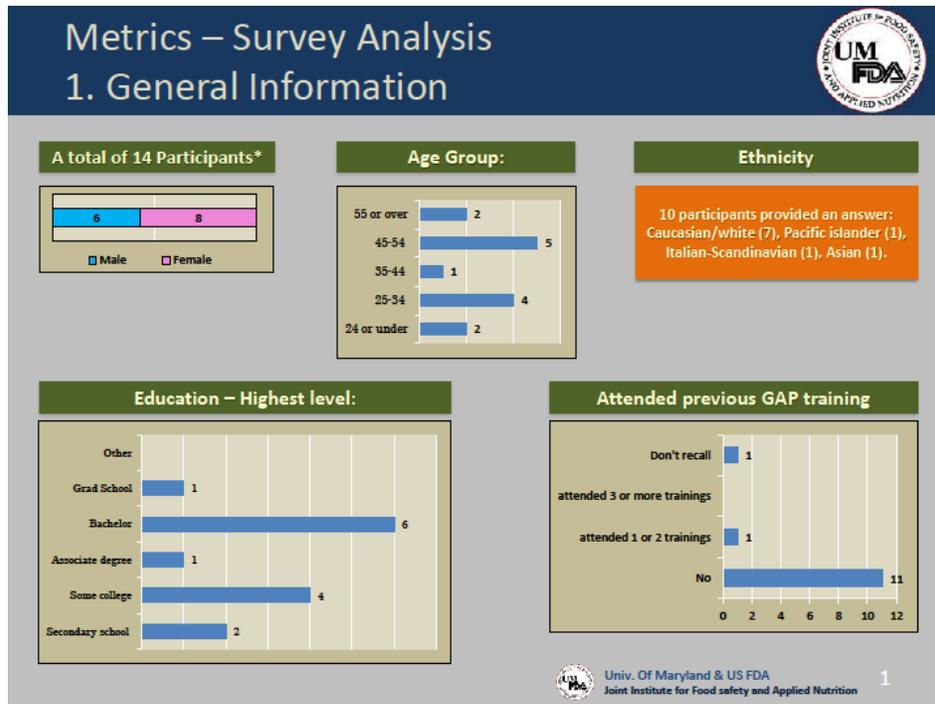
During the first year the MDA GAP certification program was offered, only three producers requested the inspection and certification. The following year nineteen specialty crop producers requested the inspection and certification. The following year (2014 crop year) thirty specialty crop producers requested inspection and certification. Feedback from the producers new to the program this year indicated the posting of others on MDA's website as having passed the inspection was encouragement to them that they could successfully pass the inspection and obtain certification.

CONTACT PERSON

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ADDITIONAL INFORMATION

Example – summary of training evaluations for one of the training sessions. Similar results were obtained from other training sessions. Evaluation/survey was developed by the University of Maryland USDA-NIFA grant #68003-21588.

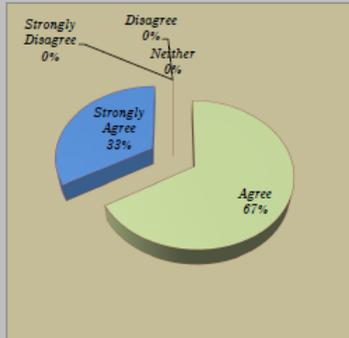


Metrics – Survey Analysis

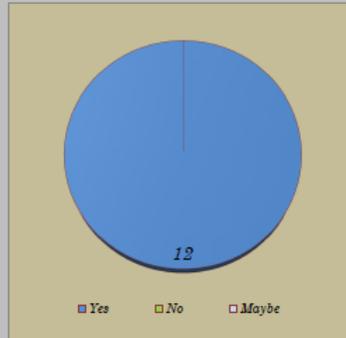
2. General Satisfaction



Your personal goals for the training were achieved:



Would you recommend this training to your peers and colleagues?

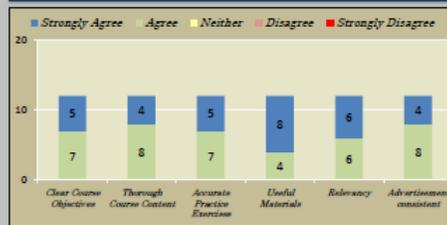


Metrics – Survey Analysis

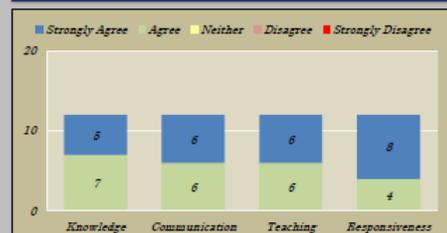
3. Detailed satisfaction



Satisfaction of the training



The instructors

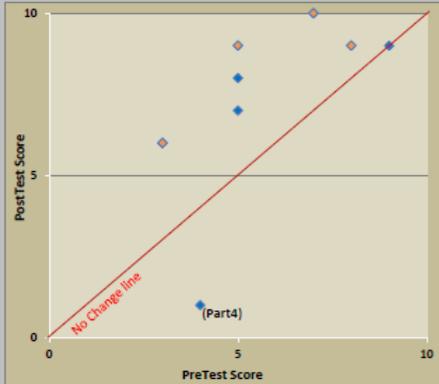


Metrics – Survey Analysis

4.a Learning - Factual tests and Self Ranking

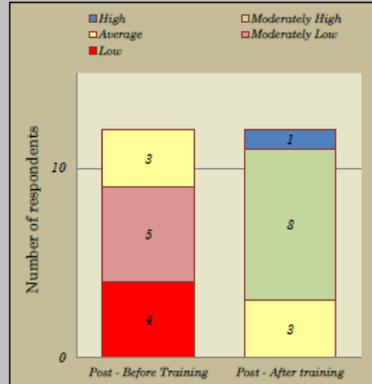


Evolution of scores on the Factual tests:



◆ Data point represent one participant
◆ Data points represent two participants

Participants' self-Ranking regarding knowledge on GAPs



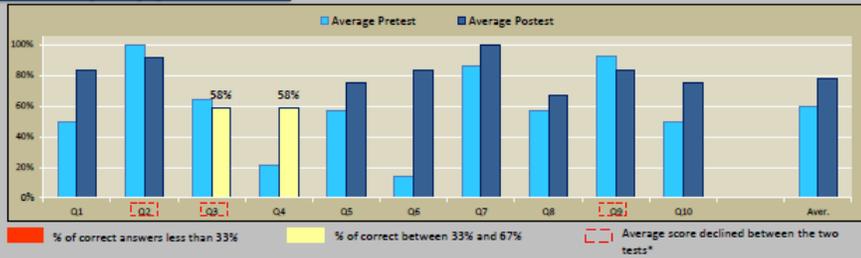
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Metrics – Survey Analysis

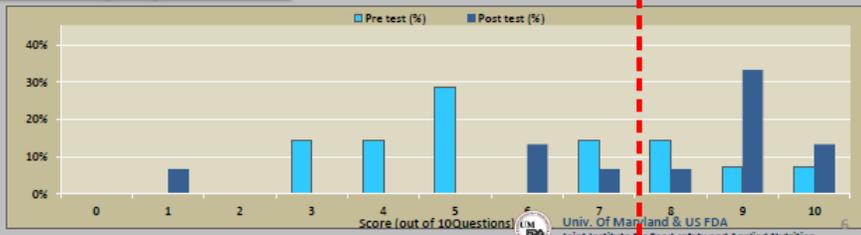
4.b Learning – Analysis with pretest & posttest



Analysis by question



Analysis by score



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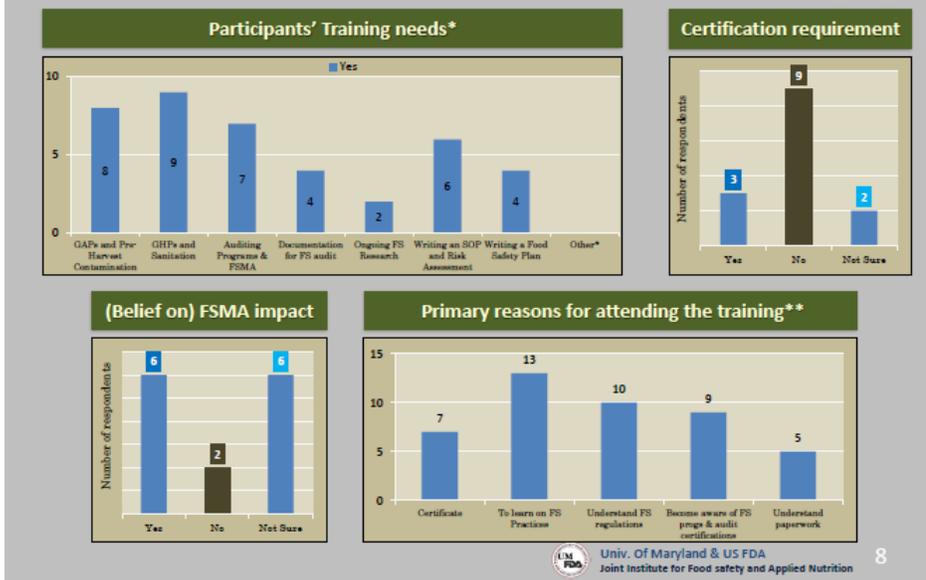
Metrics – Survey Analysis

4.c Learning – Acquired Knowledge and Ability to Apply



Metrics – Survey Analysis

5. Training Needs, and incentives to attend



Metrics – Survey Analysis

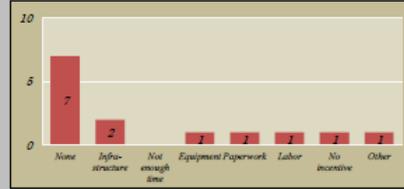
6. Barriers & Opportunities



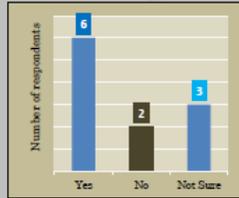
Participants Estimate on difficulties to achieve their goals from the training:



Participants Estimate on potential difficulties to receiving certification:

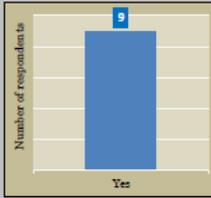


FSMA impact (after Training)



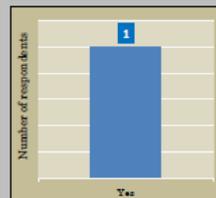
Relatively more participants expect an impact of FSMA after the training

Training effect – FS plan & Certification



Plan to apply on: April/May (1), May/June (3), August (1) and February 2015 (1).

Training – Better time*



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Metrics – Survey Analysis

7. Comments



After the training	Comments
13. What parts of the workshop did you find to be the most useful to your farming operation?	<ul style="list-style-type: none"> 4 W's, Good Agricultural Practices and Pre-harvesting Contamination, Good Handling Practices + Sanitation material was helpful. All the talks - Q and A Many areas. Questions were answered and staff helpful Great presenters! Clear material the entire workshop was helpful to clarify and refresh my memory so I will be able to better advise the farm community in AA county. Potential ways to prepare for FSMA The use of common sense in your farming practices. The information on the GAP program. GAPs auditing program education, Food Safety and Water sanitation education, Employee sanitation suggestions General overview of GAP standards and specific examples
14. Please provide us with any additional comments you would like to make about this training including suggestions for improvements.	<ul style="list-style-type: none"> N/A chairs Discussion - why? Case studies in implementation A vegetarian meal option Vegetarian meal option for lunch



FINAL REPORT

Project Title: Maryland's Best: Promoting Maryland's Specialty Crops

PROJECT SUMMARY

The Maryland Department of Agriculture (MDA) created the “Maryland’s Best” program to enable producers to capitalize on the consumer’s preference for local agricultural products including specialty crops. The Specialty Crop Block Grant program enabled MDA to continue with the Maryland’s Best program including website and various media promotions for retail and wholesale markets. The purpose of this project is to increase consumer demand for Maryland grown specialty crops and to assist farmers who grow specialty crops in finding markets for their products. In addition, there is a lot of competition from large specialty crop growers from other states wanting to get into Maryland’s consumer markets and the funding from this grant is used to increase Maryland farmers’ competitiveness.

PROJECT APPROACH

MDA’s promotions connected Marylanders through radio, TV, print and online media by advertising nursery and greenhouse plants and flowers, strawberries, wine, the Buy Local Challenge, watermelons, peaches, apples, pumpkins, and Christmas trees as part of the strategy to promote specialty crops and stimulate the demand for local agricultural products. We did not set specific goals for pageviews, bounce rate or time spent on the web site. We monitor this information monthly to determine the usage of Maryland’s Best web site.

Project Activity	Timeline	Notes
Develop a advertising/promotion campaign to promote Maryland specialty crops with Maryland’s Best	December 2011 – February 2012	Completed by MDA
Identify appropriate media mediums, i.e. radio, TV, social networking	February 2012	Completed by MDA
Implement campaign (April – Maryland wine; May- specialty crops including strawberries, asparagus, greens; June-Specialty crops at farm-stands, farmers markets; July-Eat Local Specialty Crop Challenge, Maryland peaches, fruits, vegetables; August-Maryland watermelons; September – Maryland green industry, nursery products; October-Maryland apples; November-Buy specialty crops from Direct Farm Markets; December-Maryland Christmas trees)	April 2012 – December 2012	Completed by MDA
Measure results to website by using Google Analytics	Ongoing	Completed by MDA
Develop a watermelon, peaches, apple promotion at Produce Marketing Association Trade Show targeting wholesale buyers	September 2012	Completed by MDA
Organize buyer-grower meetings	December 2011	Completed by MDA

Hold buyer-grower meetings	January 2012	Completed by MDA
Measure results to website by using Google Analytics	Ongoing	Completed by MDA
Identify sites for farmers market signs	October 2011	Completed by MDA
Procure signs and put up	Nov-March 2011-12	Completed by MDA

2012 Specialty Crop Advertising

Month	Target Promotion	Target media	Web Visits
March	Nursery and Garden Centers	Urbanite	1,962
April	Nursery and Garden Centers	WYPR, Urbanite, Washington post	3,768
(***) is made possible by the Maryland Department of Agriculture, inviting listeners to enjoy the outdoors and to care for gardens. To learn about planting trees, shrubs, bulbs and flowers to enjoy this spring and summer, and to find a local nursery or garden center, marylands best dot net			
May	Strawberries	WYPR, Urbanite, Washington Post, Advanced Digital Group	5,407
(***) is made possible by the Maryland Department of Agriculture, inviting listeners to enjoy fresh, local strawberries. Selecting berries includes looking for a full, bright-red color and firm, plump flesh. To find farm stands, pick your own, and farmers' markets featuring Maryland strawberries, Marylands best dot net.			
June	Wine	WYPR, Urbanite, Washington Post, Advanced Digital Group	8,823
July	Buy Local Challenge	WYPR, Urbanite, Washington Post, Advanced Digital Group, Event, Press Release	10,576
(***) is made possible by the Maryland Department of Agriculture, inviting listeners to eat locally grown and produced foods during Maryland's <i>Buy Local Challenge</i> , July 21st through the 29th. Available at farmer's markets, farm stands and the "local aisle" of grocery stores. For information, marylands best dot net. <i>Buy Local. Eat Fresh.</i>			
August	Watermelons, Peaches,	WYPR, Urbanite, Washington Post, WJZ, Advanced Digital Group, The Packer, Event, Press Release	6,216
(***) is made possible by the Maryland Department of Agriculture, inviting listeners to enjoy fresh, local peaches. Selecting peaches includes choosing deeply colored fruits that are firm but slightly soft to the touch. To find farm stands, pick your own, and farmers' markets featuring Maryland peaches, Marylands best dot net.			
September	Apples	Urbanite, Washington Post,	3,656

		WYPR, Advanced Digital Group, Press Release	
October	Pumpkins	Urbanite, Advanced Digital Group, Washington Post, Fresh Summit Daily, WYPR, Press Release	2,931
(***) is made possible by the Maryland Department of Agriculture, inviting listeners to venture outdoors and discover Maryland's pick-your-own pumpkin patches. This October, visit a local farm to select a pumpkin for the perfect jack-o-lantern or to make your favorite fall treat. To find a pumpkin patch near you, go to marylandsbest.net			
December	Christmas Trees	Urbanite, Washington Post, WJZ, WYPR, WTOP, Press Release	2,427
(***) is made possible by the Maryland Department of Agriculture, inviting listeners to visit a Maryland Christmas tree farm. This holiday season, local farms have trees, wreaths, garlands, and more. To find a farm near you, Maryland's best dot net			

Advertising Impressions and Listeners

Month	Promotion	Estimated Ad Impressions	Estimated Radio Ad Listeners
March	Nursery and Garden Centers	143,000	-
April	Nursery and Garden Centers	205,109	400,000
May	Strawberries	378,076	400,000
June	Wine	396,709	400,000
July	Buy Local Challenge	675,261	800,000
August	Watermelons, Peaches	409,131	400,000
September	Apples	384,286	400,000
October	Pumpkins	259,920	400,000
December	Christmas Trees	303,396	400,000

Total Estimated Advertising Impressions: 3,154,888

Total Estimated Radio Advertisement Listeners: 4,000,000

Buyer-Grower Event

In January, MDA hosted a Buyer-Grower Event at the Navy-Marine Memorial Stadium – N Room. This tradeshow style event is designed to connect Maryland specialty crop growers with buyers from grocery retailers, restaurants, schools, and other venues. In 2012, we had nearly 300 participants in the event and in the post-event evaluation; nearly all farmers that exhibited indicated they increased their sales as a result of contacts from the event. A larger venue was chosen to hold the event in 2012 due to growing interest in local specialty crops.

Buy Local Challenge

Funds from this grant were used to promote Maryland's Buy Local Challenge. The purpose of this challenge is to get consumers to eat at least one local fruit or vegetable a day for a week. The challenge

is held during July at the peak of Maryland's specialty crop growing season. All of the Maryland's Best advertisements for this promotion only featured fresh fruits and vegetables. In addition, non-specialty crop funds were used in kind to design the advertisements.

Chefs Go Fresh Event

In an effort to reach chefs in the DC metro area and increase their usage of specialty crops from Maryland, MDA sponsored the Chef's Go Fresh Event put on by the Georgetown Media Group. The event consisted of a motorcycle tour for DC chefs to visit specialty crop producers in Maryland. Around 50 chefs participated in the event and were educated on the wide range of specialty crops that Maryland farmers offer. By being a sponsor, the Maryland's Best logo was used on all of the promotional materials for the event including cards, advertisements, and t-shirts. In addition several editorial articles were included in the Georgetown that brought attention to specialty crops in Maryland. A directory of Maryland specialty crop producers was given to all of the participating chefs.

Maryland's Best Farmer's Market Signs

While the number of consumers who shop at farmer's markets continues to rise in Maryland, it is increasingly important to identify these locations. Farmer's markets in Maryland are identified on roadways by large signs that feature the Maryland's Best logo. Signs funded by this program have been installed in Baltimore, Worcester, Wicomico, Anne Arundel, & Queen Anne's county.

The vast majority of products at the farmer's markets with signs are specialty crops. In addition, the total costs for installation and maintenance for the 22 signs was \$15,540, with \$10,540 being covered by the State Highway Administration.

Maryland's Best Soundbooks and DVD's

MDA continues to work with a professional photographer to expand on our "Sound Book." Sound Books bring the story of Maryland's farmers to the consumer; it's a photographic slideshow with narration from the farmer. Cut flowers, fruits and vegetables, PYO's and microgreens were profiled in the sound books. The books were placed on Maryland's Best website and shown in some grocery store chains and trade shows. The images and sound are of high quality and it made an attractive promotional item. Links to the soundbooks can be found at <http://www.marylandsbest.net/soundbooks.php>.

Link to Soundbooks <http://www.youtube.com/playlist?list=PL60AB5D4B856B031C>

PMA Fresh Summit

From October 18-20th the Marketing Office of the Maryland Department of Agriculture exhibited at PMA Fresh Summit in Anaheim, CA. Fresh Summit is one of the largest fresh produce and floral expos and includes over 800 exhibitors and more than 21,000 attendees.

MDA's 2012 Fresh Summit strategy was to reach out to produce buyers and directors for grocery retailers that have a presence in Maryland and surrounding markets. The initial contact was made through an email and calling campaign, offering MDA's services and efforts in finding out how we could best serve their stores. A number of these contacts confirmed that they would be stopping by our booth and were very interested in learning more about produce from Maryland growers. In addition, an advertisement was placed in the Fresh Summit Daily which is the official newspaper for the expo and is printed and distributed each day during the three day trade show. The message was targeted towards

retailers in Maryland letting them know that consumers prefer and have the buying power to purchase Maryland grown specialty crops.

During the trade show, MDA had a 10ft x 10ft booth that featured a DVD on Maryland produce growers, Maryland specialty crop wholesale grower directories for buyers (hard copies & PDF on a thumb drive), new Maryland’s Best promotional give-aways, informational handouts on Maryland “Local” laws, and market research on Maryland Consumers.

In total, we had over fifty attendees stop by the MDA booth including 15 key strategic contacts for networking opportunities, inquiries on Maryland produce growers, and information on MDA marketing campaigns. This included meetings with the following retailer buyers: Supervalu, Fresh Direct, Wal-Mart, Bozzutos, Wakefern Food Corp, BJ’s Wholesale, and Costco.

A number of retailers were not able to stop by during the tradeshow. The main reason for this was that many buyers left the trade show early in order to return to the east coast before Hurricane Sandy. However, due to initial pre-show contact efforts we were able to establish communications with these companies and are working with them to set up meetings in the near future.

This project only funded specialty crop promotions as indicated in the work plan. Other Maryland’s Best promotions and advertising were charged to Maryland State funds or other grants.

Goals	Outcomes
Increase visits to Maryland’s Best Web site	In 2012 we had 52,581 visitors to the site. This is a 53% increase over the 34,392 visitors in 2011 and well over the 10% goal increase.
Increase access of specialty crop producers to diverse marketing channels	There were 80 buyers that participated in the 2012 Buyer-Grower Expo representing grocery retailers, restaurants, schools, and other venues
Maintain Maryland consumers’ preference local through promotions and advertising	According to the University of Baltimore’s Schaefer Center study the consumer preference for local produce has stayed at 78%.
Promote farmers markets with road signs featuring Maryland’s Best logo and update information	20 farmer’s market signs have been installed throughout the state. This sign program is continuing to grow.

BENEFICIARIES

Specialty crop producers throughout the state benefited from marketing efforts funded by the Specialty Crop Block Grant. According to the 2007 USDA NASS Census there are 1,581 farmers in the state who produce specialty crops. To break it down: there are 518 vegetable farms, 390 fruit producers and 673 greenhouse and nursery farms. Additionally consumers of specialty crops benefited from the connection to Maryland producers. Using Maryland’s Best visits as an approximation would imply more than 50,000 consumers were able to identify sources of local specialty crops in the period of this grant.

LESSONS LEARNED

When targeting buyers at tradeshow, it is important to have an electronic version of specialty crop directories to hand out to buyers. They are easier to carry and allow the buyer to go on their computer after the show and look through the different types of growers. In addition, establishing contact with specialty crop buyers and setting a date and time to meet before the trade show is extremely important.

It is also extremely important to get buyers out on the farm for tours. MDA takes grocery retail buyers out on numerous farm tours each year where they are able to connect with farmers. Both farmers and the buyers greatly appreciate MDA's efforts to connect the two and feel easier in starting the business relationship. In addition, it is important to get chefs and other restaurant produce buyers to visit specialty crop farms as well. During the Chefs Go Fresh event, while touring a large greens grower in Maryland, it was very eye opening to see some of the chefs out on a large scale farm for the first time and seeing how kale grows in the field that they use in their restaurants. These experiences for the chefs increased their desire to source locally and build a relationship with the farmer.

CONTACT INFORMATION

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ADDITIONAL INFORMATION



FINAL REPORT

Project Title: Maryland's Farm to School

PROJECT SUMMARY

The Maryland Farm to School program was created in 2008 through the Maryland General Assembly to promote the sale of Maryland farm products to local schools. A goal of the program is to work with the school systems to purchase more Maryland-grown produce into school cafeterias and to educate children about where their food comes from and the benefits of a healthy diet. The Maryland Farm to School program connects schools and local farms with the objectives of serving healthy meals in school cafeterias, improving student nutrition, providing nutrition education opportunities, and supporting local farmers. This project is timely due to the improved nutrition standards implemented as a result of the Healthy, Hunger-Free Kids Act of 2010 in which local food can be a part of school meals. Through the efforts of the previous Specialty Crop Block Grant, the school systems purchased a high percentage of the vegetables and fruits for Maryland Homegrown School Lunch Week, a project of Maryland Farm to School. The Specialty Crop Block Grant program enabled MDA to continue with the Maryland Farm to School program to work with school systems who wanted to purchase Maryland-grown produce for their school meals.

PROJECT APPROACH

Maryland schools serve approximately 70 million lunches and 25 million breakfasts annually through the National School Lunch and Breakfast Programs. School Meal Programs are self-supporting and operate solely on limited federal reimbursements with little or no financial support from their respective jurisdictions.

The Maryland Farm to School Program receives no state or private funding and is coordinated by a working committee led by the Department of Agriculture and the State Department of Education. Statewide Farm to School activities includes the annual Maryland Homegrown School Lunch Week. During this week, public school systems feature local items on the lunch menu, conduct nutrition education activities, and celebrate local produce. Since the Farm to School Program was created, the school systems in Maryland have focused on purchasing fresh, specialty crop products either during Maryland Homegrown School Lunch Week or throughout the year. The Maryland Farm to School Program continues to drive increased consumption of locally grown produce in Maryland public schools. Maryland was first state in the country in which all of its public school systems participate in the program. For example, in Harford County Public Schools (HCPS) the school system buys direct from 7 farms, they have 38,000 students in 54 schools with 15 production kitchens and serve nearly 5 million meals during the school year. In the Maryland growing season, HCPS will purchase 70-80% of their produce locally. In another school system with over 75,000 students, the amount of local specialty crops procured have grown from 0 pounds in 2009 to over 210,000 pounds in school year 2013. The program still continues to focus on the engagement of the public school systems. One Maryland farmer who sells fruits to the schools has increased its sales from 0 in 2009 to 5% in 2014. According to the USDA Farm to School census, Maryland's school systems spend approximately \$9.3 million of their school food budget on local food with the majority of the sales on specialty crops. Ninety-one percent of the local food purchases are vegetables followed by 86% of the local food purchases are Maryland fruits: apples, tomatoes, peaches, watermelon and corn were the top purchases by the public school

system. All marketing materials and assistance has promoted specialty crops in school meal programs including the Fresh Fruit and Vegetable Program. All marketing materials, assistance, and activities were solely related to specialty crops. There was no revised budget or work plan submitted from the second annual performance report due to the fact that the remaining funds of the grant were used to create additional collateral material and promotion since it was a continuation of one of the goals of the grant.

GOALS AND OUTCOMES ACCIEVED

The Maryland Farm to School connected with school administrators, teachers, PTO's parents and students through radio, social media, collateral materials, Buyer-Grower Expo, Maryland Homegrown School Lunch Week, and education outreach.

Social Media

We continue to use the Maryland Farm to School Facebook page as a source of information for the program and we have posted success models, events and other farm related times on the page. We've increased our number of "likes" from 321 in 2011 to 1,670 in 2014, thus surpassing our goal on the number of "likes" for the program. We started to use Twitter during this grant period, we have gained 970 followers in the past 2 and half years.

Website page views

The Maryland Department of Agriculture's website was updated again. The number of pageviews on the Maryland Farm to School portion of MDA's website was 1,707 from September 1, 2014 to November 1, 2104. The average time on the site was 1:48 minutes. On the Maryland's Best website under Farm to School, there were 28 searches.

Maryland's Best Buyer-Grower Expo

We also worked with staff from MDA's Marketing Department to host the MDA's Buyer-Grower Expo which included specialty crop farmers who sell to schools and schools who want to buy from Maryland's specialty crop producers. In the past two years, there were approximately 15 school districts represented at the Expo. As a result of the Expo, we took one school foodservice director to visit a large wholesale farm.

Maryland Homegrown School Lunch Week

Governor Martin O'Malley officially designated September 23-27, 2013 and September 15-19, 2014 as Maryland Homegrown School Lunch Week. "It is vital that we help our children make the connection between the agriculture industry and what we eat daily. Buying locally is key to ensuring a smart, green and growing future for Maryland families. It preserves farmland, protects the environment, bolsters local economies, and provides wholesome, nutritious, great-tasting fresh food," said Governor O'Malley. "We are extremely encouraged that all 24 of our public school systems and some private schools are participating in this important, educational program."

In 2013, educators, farmers, and federal, state and local officials gathered with Pangborn Elementary School students in Washington County to kick off the 6th annual Maryland Homegrown School Lunch Week by eating healthy lunches, full of locally-grown fruits, vegetables, beef, chicken and pork. Students (and officials) also enjoyed special classroom activities and hands-on outdoor educational activities with farmers. Following lunch, the 150 kindergarten students toured Misty Meadow Farm Creamery in Smithsburg. Maryland Agriculture Secretary Buddy Hance underscored the importance of

Maryland Homegrown School Lunch Week and agricultural education. “This year we have nearly 50 farmers participating in the program. Our goal is to see more local, fresh food in school lunches, not only to improve childhood health but also to help them learn about the importance of our farms to our environment and daily lives. “Good nutrition is key to academic excellence. During Maryland Homegrown School Lunch Week, we acknowledge the cafeteria as a classroom, where school meals offer students fresh, healthful, and local meals daily,” said State Superintendent of Schools Lillian Lowery.

In 2014, educators, farmers, and federal, state and local officials gathered with Gwynn Park High School students in Prince George’s County to kick off the 7th annual Maryland Homegrown School Lunch Week by eating healthy lunches, full of locally-grown fruits and vegetables. Students (and officials) also discussed the diverse opportunities for careers in agriculture and culinary arts. Prince George’s County Public Schools, one of the state’s largest school systems, has observed Maryland Homegrown School Lunch Week since it began in 2008 by incorporating fresh, local foods in student meals. Today, more than 1,100 students at Gwynn Park High School in Brandywine, Prince George’s County, enjoyed lunches that included café burgers with local tomatoes from Bartenfelder Farm and Boston Bibb lettuce from Chesapeake Greenhouse, vegetable stir fry with local peppers from Bartenfelder Farm, Tuscan kale salad with local kale from Chesapeake Greenhouse and fresh apples from Baugher’s Orchards.

“We know that proper nutrition is essential to academic achievement. Homegrown School Lunch Week increases students’ access to nutritious Maryland-grown product, while educating students on seasonal food production and the availability of local, healthy food,” said State Superintendent Dr. Lillian Lowery. “Homegrown School Lunch Week celebrates the juncture of academia and agriculture, science and health, schools and their communities; this week exemplifies the partnerships that are necessary to prepare world class students.”

“It is vitally important that students be made aware of the various career opportunities available in the agriculture sector,” said U.S. Department of Agriculture Assistant Secretary for Administration Dr. Gregory L. Parham.

Prior to lunch, agriculture and education officials spoke with about 100 students about the connection between farms and food to enhance student understanding of where their food comes from, how it is produced, and the benefits of a healthy diet. Remarks also highlighted career opportunities in agriculture and culinary arts. Speakers included U.S. Department of Agriculture Assistant Secretary for Administration Dr. Gregory L. Parham, Maryland Agriculture Secretary Buddy Hance; State Superintendent Dr. Lillian Lowery, Prince George’s County Public Schools Chief Operating Officer Monica Goldson. Kevin Maxwell, Gwynn Park High School Principal Tracie Miller and student Kason Bibbins.

Maryland’s Farm to School SoundBooks

The Maryland Farm to School program worked with a professional photographer to expand on our “Sound Books.” Sound Books bring the story of Maryland’s schools and farmers together with a photographic slideshow with narration from the farmer and others involved with the program. We have found the Soundbooks very successful in telling the Maryland Farm to School story. There’s one soundbook on [the Maryland Farm to School website](#) and [Prince George’s County Public School](#) and [Caroline County Public School](#) are on YouTube. One of the three Farm to School Soundbooks, one-half

of that Soundbook features specialty crops while the other half features non-specialty crops. The non-specialty crop portion of the Soundbook was funded through other means

Maryland Secretary of Agriculture Earl Hance featured the Washington County Public School Soundbook during his keynote presentation “Maryland Farm to School: Making a Difference” at the 2013 Maryland School Nutrition Association Conference.

Standard

The goal to “create a standard which is adopted by schools to accurately measure the amount of local specialty crops procured from Maryland farmers for the Farm to School program,” was no longer applicable since the USDA FNS Farm to School team used its resources to create a Farm to School Census to establish realistic goals with regard to increasing the availability of local foods in schools. The Census questionnaire primarily asked all U.S. public school districts about their farm to school activities during the 2011-2012 school year.

School Collateral Materials

The program distributed over 6,000 posters, 600,000 bookmarks, 600,000 stickers, 2,000 window clings to each of the 24 schools systems and 300 “This Farm Feeds Schools” to producers provided product to the schools during the Maryland Homegrown School Lunch Week (MHSLW). A Maryland Farm to School brochure was created with new seasonality charts for Maryland specialty crops for schools, parents and the public. In addition to the above materials, we piloted the Farmer-Specialty Crop trading card with this grant. The card featured a specialty crop product on one-side, i.e. watermelon or apple and the farmer on the other side. 65,000 cards were printed and 42,000 cards were distributed to 4 school systems. The producer on the card sold Maryland-grown product to the particular school system. The pilot was successful and we will print more cards with the next grant. The farmers were particular pleased with the cards that a few of them have asked for their picture to be on the card.

Radio ads

We decided to place 2 weeks of radio ads on WYPR this year to promote Maryland Homegrown Lunch Week in September. As a result of the promotion, 167,000 different persons, age 6+, each heard 2.8 announcements. Example of radio ads:

(***) is made possible by the Maryland Department of Agriculture's Farm to School program. September 15th through the 19th is Homegrown School Lunch Week in Maryland schools. Students may be able to enjoy Maryland-grown apples, squash, sweet peppers, tomatoes and watermelon available in their school lunches. To find out more go to Maryland farm to school dot org

(***) is made possible by the Maryland Department of Agriculture's Farm to School program. September 15th through the 19th is Homegrown School Lunch Week in Maryland schools. Students may be able to enjoy Maryland-grown apples, squash, sweet peppers, tomatoes and watermelon available in their school lunches. To find out more go to Twitter at MDFarm2School

Education Outreach

Maryland Farm to School staff worked with a local apple producer for an apple-tasting event to the Cape St. Claire Elem School - Student-Age Child Center (SACC) in 2013. SACC is an after-school program

run through the Anne Arundel County Parks and Recreation dept. Ninety-students (K-5) along with some parents tasted 5 varieties of apples as part of "Healthy You" theme in October. The tasting was considered an "enrichment activity and parents had to sign waiver form for the children to participate in the tasting. As part of the activity, the students charted their apple preferences and staff also talked about Maryland apple growers. According to the student's survey, the student's preference was Jonagold followed by Golden Delicious.

The Maryland Farm to School program in conjunction with the Maryland Agricultural Education Foundation (MAEF) created the Mid-Atlantic Farm-Based Educators Network (MFBEN)- farm-based educators represent farms, non-profits, agencies, and ag businesses who work in agricultural settings teaching students K-12. We have discovered that the farm-based educator host thousands of children every year on their farms and they're in need of in-service training and professional support. It's an opportunity to work with informal education providers to make the connection on local specialty crops in the cafeteria to the classroom to the community.

- Over 20 science teachers, outdoor educators, nonprofits and a federal agency attended *Farm-Based Education: Taking Students to the Field (and Greenhouse)* a day-long workshop hosted by MDA's Farm to School program and the Maryland Ag Education Foundation as part of the Maryland Association of Environmental and Outdoor Education Conference. Local farms and agricultural operations can provide teachers with outstanding opportunities to connect students to real-world science issues facing our communities and region today. Participants visited two Eastern Shore farms including: Baywater Greens, a hydroponic greenhouse enterprise situated on a sixth generation diversified farm, welcomes students and teachers throughout the year to learn about technological innovation in agriculture. Bordeleau Winery hosted the group through the fascinating chemistry-rich world of crafting award-winning wines while stewarding a critical waterfront landscape. Teachers also learned how to contact and work with farmers to build relationships and opportunities in science education through agriculture. All of the day's activities served as a model to taking students to the field for enriched, meaningful outdoor experiences.
- Maryland Farm to School and MFBEN hosted 2 workshops with 90 educators attending in 2013. The agenda included discussion on how to structure and align farm-based education activities to meet standards (E-Lit, Next generation, STEM, Common Core), sharing and developing curriculum (with an emphasis on expanding to middle and high school grades), and introducing some evaluation methods into pre/post and in- field experiences. MAEF and MFEB developed a special "Pumpkin Papers" to be used by MFBEN which tied into Maryland education standards.
- Continue to work with the Maryland State Department of Education (MSDE) to include vegetable gardens in "Conserving and Enhancing the Natural Environment: A Guide to Planning, Design, Construction, and Maintenance on New & Existing School Sites" (commonly referred to as the Green Book). The use of vegetable gardens within the Green Book would be less than 20% of the total budget. The Maryland Farm to School is partnering with MSDE and the Maryland Association for Environmental and Outdoor Education (MAEOE) on this project and the project did receive funding from a Chesapeake Bay Watershed Education and Training grant.
- The Mid-Atlantic Farm-Based Educators Network applied for a Chesapeake Bay Trust Grant (CBT) which would host a series of workshops featuring Farm to School and to develop a curriculum for the farm-based educators.

- A staff person from the Maryland Farm to School program attended the National Farm to Cafeteria conference in Austin, TX in April 2014. As a result of the conference, a farmer\info trading card was piloted in 3 school systems in 2014.

BENEFICIARIES

Specialty crop producers throughout the state benefited from marketing efforts funded by the Specialty Crop Block Grant. According to the 2007 USDA NASS Census there are 518 vegetable farms and 390 fruit producers. We estimate that approximately 60 Maryland producers have sold to Maryland schools. Over 800,000 students were exposed to local specialty crop information during Maryland Homegrown School Lunch Week for the past three years.

LESSONS LEARNED

There’s still a great deal of work that needs to be done to make the connection in the cafeteria to the classroom. Maryland school foodservice directors are procuring local specialty crop products, however, students and teachers often don’t realize that there’s local product coming from local farms in the cafeteria. It would be beneficial if formal education standards on agriculture and food production was created to meet the education standards on a statewide basis and provide professional development to the teachers to make that connection in the cafeteria to the classroom.

It’s still a challenge to gain sale information from farmers on the amount of specialty crop product sold to schools. Schools report on the number of meals served through the National School Lunch Program for reimbursement and their computer systems do not track very well the amount of local specialty crops. While the USDA Farm to School census has helped to create that level of awareness to track local product, there’s still much work that needs to be done. One school system has started to work with their distributor to track local specialty crops. The new nutrition standards for school meals have created more opportunities to procure local specialty crop products.

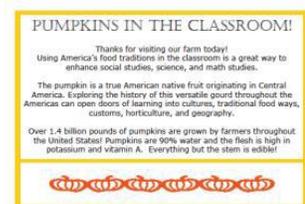
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ADDITIONAL INFORMATION

Static cling

Part of the Pumpkin Papers





4



From **Maryland** fields to **Maryland** schools

Your Choice Makes A Difference

MARYLAND Farm to School

Choose Maryland-Grown.

Maryland Farm to School connects schools to local farms to provide Maryland students with fresh, nutritious, delicious foods.

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Awesome **APPLES**

Marvelous **WATERMELON**



MARYLAND Farm to School

Choose Maryland Grown.

Maryland Farm to School helps schools source from local farms for fresh healthy foods in schools meals and encourages experiential education activities.

www.marylandfarmtoschool.org



A program of Maryland Department of Agriculture

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From **Maryland** fields to **Maryland** schools

MARYLAND Farm to School

FINAL REPORT

Project Title: Marketing Maryland-Delaware Watermelons in New England

PROJECT SUMMARY

Delaware and Maryland are major players in the U.S. watermelon industry. In 2008, of the 44 states that produce watermelon, Delaware and Maryland ranked in the top 10 based on product value, generating a combined \$26.4 million, while producing more than 11 million watermelons. The bulk of those melons are yielded from just a few thousand acres in Dorchester, Caroline, and Wicomico counties on Maryland's Eastern Shore and Sussex County, Delaware.

While watermelons are a major fruit crop in the region, consumption has remained relatively flat in the nation. According to the USDA, consumption was about 15.4 pounds in 2008. In 1970, consumption was about 13.5 pounds. By comparison, consumption of strawberries in the United States has gone from 1.7 pounds annually in 1970 to 6.4 pounds in 2008. Watermelons are a major part of the agriculture economy on the Eastern Shore, but with a market that is not booming and strong competition from the South and Mexico, promotions to increase demand are essential.

This was a joint project with the Maryland Department of Agriculture (MDA) and Delaware Department of Agriculture (DDA) collaborating with the Mar-Del Watermelon Association. Maryland-Delaware watermelon producers have benefitted from the demand for local watermelons in Maryland and Delaware. This project targeted the New England states that have been a traditional market for watermelons from the Eastern Shore with in-store promotions and advertising. This project also included a market analysis prepared in advance of promotions to assure the potential for the strategic success of promotions. Research and planning took place in late 2011 to mid-2012, while the actual promotion took place during the 2012 Maryland and Delaware watermelon season which runs from mid-July to early September.

PROJECT APPROACH

Initial plans for this project were discussed and finalized by the Maryland & Delaware Departments of Agriculture with the Mar-Del Watermelon Association in December 2011 and early 2012. Request for proposals to hire a consultant were sent out in January 2012 and the selection process took place at that time as well. The research report from the consultant was delivered in March. This report included historical information on Maryland and Delaware watermelon sales in New England, potential for growth, New England Consumer preferences, and key New England watermelon buyer contact information. Using the report, the three parties involved determined a plan of action.

First it was determined that using assistance from the National Watermelon Promotion Board we would exhibit at the New England Produce Council – Floral and Produce Expo to network with key retailers in the area. Next we determined our target audience and which advertising options would best reach this audience. Two radio stations were selected to run MAR-DEL watermelon advertisements during the

watermelon season, which runs from late July to early September. In addition, promotions were planned in August with the Watermelon Queen doing an on air radio interview during a Boston Red Sox Game (part of the advertising package with the radio station), as well as three in-store promotions in the Boston area at the highest traffic stores determined by contacts at each retailer. Lastly, we met to review the project and to discuss evaluation.

Project Activity	Timeline	Notes
Meet to discuss initial plans of project	December 2011 to June 2012	MDA, DDA, and Mar-Del Association met several times to discuss and determine plans for project
Hire Consultant	January 2012	After sending out an RFP, Market Solutions LLC was selected
Consultant Report Due	March 2012	Report included information on sales of MD & DE watermelons as well as a project plan, and key contact information.
Contact Buyers	March to April 2012	MDA & DDA contacted retail watermelon buyers in New England
Exhibited at the New England Produce Council Produce Expo	April 2012	MDA & The Mar-Del Watermelon Queen exhibited with the National Watermelon Promotion Board targeting retail buyers
Determined Advertising Plan	May 2012	MDA, DDA, & Mar-Del Assoc evaluated advertising options and message
Implement Promotion	July to September 2012	MDA, DDA, & Mar-Del Assoc
In-Store Promotions & Radio Interview	August 012	Radio interview and in-store promotions by MDA & Mar-Del Assoc
Project Review and Evaluation	October to November 2012	MDA worked on project evaluation

New England Produce Council – Floral and Produce Expo

MDA and the Mar-Del Association exhibited at the National Watermelon Promotion Board’s booth at this expo. The expo provided us with the opportunity to network with several key retail buyers from New England and to discuss their interest in partnering in a MD & DE watermelon promotion during the season. Key retailers that were met during this expo were Wegmans, Whole-Foods, Wakefern, Shaw’s Supermarket, Stop & Shop, and Market Basket. Hand outs targeting retailers were created to tell the benefits of MD & DE watermelons as well as the scope of the promotional campaign.



Retailer Handout on Promotional Campaign



Retailer Handout on MD & DE Watermelons

MAR-DELicious Watermelon Radio Advertising

MDA, DDA, and the Mar-Del Association evaluated advertising proposals from New England, specifically targeting the Boston Metro Area as the most densely populated area. The two stations selected were WODS and WEEI. The decision was made to use the already established name of MAR-DELicious watermelons to represent watermelons from Maryland and Delaware. This is a brand created by the Mar-Del Watermelon Association and all of the watermelons shipped to New England were shipped in bins with the Mar-Delicious logo and placed in the stores in the same bins. In addition, press releases were written and distributed by MDA and DDA targeting retailers and consumers.

- Radio Advertising with WODS - 103.3 FM from 7/23 to 8/26. This station covers the Greater Boston Area

Example of WODS Advertisement copy:

SUMMERTIME MEANS MAR-DEL WATERMELON SEASON! AND WHY BUY MAR-DELICIOUS? NOT ALL WATERMELONS ARE EQUAL, BUT THE SWEET TASTE OF MAR-DELICIOUS STANDS OUT FOR ITS RIPE FRESHNESS AND SUGARY ENJOYMENT, DELIVERED FROM THE FARM LINED SHORES OF THE CHESAPEAKE BAY TO YOUR LOCAL NEW ENGLAND SUPERMARKETS LITERALLY WITHIN HOURS OF HARVEST! MAR-DELICIOUS WATERMELONS ARE AVAILABLE AT SHAW'S, WHOLE FOODS AND MANY OTHER GROCERS THROUGHOUT NEW ENGLAND! GET YOUR MAR-DELICIOUS WATERMELON TODAY

- Radio Advertising with WEEI - 93.7 FM & 850 AM from 7/27 to 8/14. This is the Red Sox Radio station and along with their affiliates they cover Massachusetts, Rhode Island, New Hampshire, Maine, Connecticut, Vermont, and New York

Example of WEEI Advertisement Copy:

WHERE DO SOME OF THE BEST WATERMELONS COME FROM? RIGHT HERE IN THE UNITED STATES! MAR-DEL WATERMELONS ARE VINE RIPENED FOR SWEETNESS IN PERFECT GROWING CONDITIONS, AND THAT'S WHAT MAKES THEM MAR-DELICIOUS!

MAR-DEL WATERMELONS ARE DELIVERED FROM THE SHORES OF THE SCENIC CHESAPEAKE BAY TO YOUR STORES WITHIN 12-18 HOURS AFTER PICKING, SO YOU CAN HAVE FRESH, LOCAL WATERMELON! MAR-DEL WATERMELONS ARE AVAILABLE NOW THROUGH EARLY SEPTEMBER! MAR-DEL WATERMELONS ARE AVAILABLE AT STOP AND SHOP AND MANY OTHER NEW ENGLAND GROCERS!

Radio Interview

On August 8, 2012 MDA and the Mar-Del Watermelon Queen put on a promotion at the Boston Red Sox Game as part of our advertising plan with WEEL. During this game Maryland and Delaware watermelons were plugged by the radio announcers as well as an interview with the MAR-DEL Watermelon Queen encouraging consumers to get MAR-DELicious watermelons.

In-Store Promotions

Strategic partnerships were formed with New England grocery retailers including Stop & Shop, Shaw's Supermarkets, and Whole Foods. In-store promotions were conducted at flag ship locations of these chains. Many of the stores in the region ran specials in their circulars for MAR-DELicious watermelons during the promotion period. The in-store promotions featured the Mar-Del Watermelon Queen, watermelon samples, bins featuring the MAR-DELicious logo, watermelon eating contests, recipe card and MAR-DELicious bag give-aways, and watermelon carving contests. Several other grocery retailers were involved in the promotion through using the MAR-DELicious bins and running ads in their circulars, however only the three retailers mentioned above took advantage of radio advertising and in-store promotions.



Example of MAR-DELicious Bins in New England stores

In-Store Promotion in Dedham, MA



GOALS AND OUTCOMES ACHIEVED

Goal 1 – Develop an understanding of New England market for watermelons

Objective 1 – Create a report which identifies buyers of watermelons in New England and gives guidance on effective strategic marketing for the region.

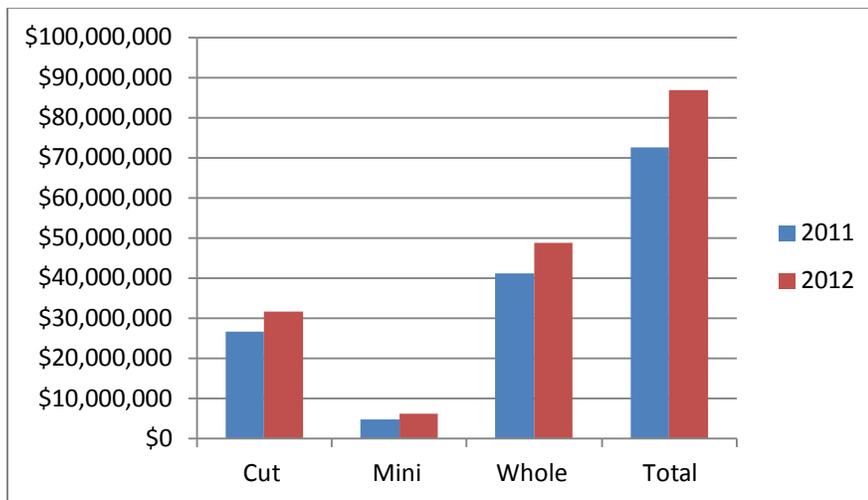
Outcome 1 – After requests for proposals for the initial report were sent out to three potential experienced contractors, Market Solutions LLC was selected due to their experience and thorough proposal. The report that was delivered gave clear insight into the New England watermelon market through historical sales figures and studies on consumer preferences. In addition key buyers of watermelons were identified and a suggested plan for moving forward in the project was given.

Goal 2 – Increase sales of watermelons to New England

Objective 2 – Establish a baseline and DDA/MDA will survey results at end of project with an objection of 10% increase in sales

Outcome 2 – Through the help of the initial report completed by Market Solutions LLC and assistance from the National Watermelon Promotion Board as base line was determined for MD & DE sales of watermelons and watermelon retail sales in New England. During the period of the promotion, which was late July to September, it was reported by watermelon buyers in New England that nearly all of the watermelons in the area were from Maryland and Delaware, with a very small portion of watermelons from other states.

New England Watermelon Retail Sales in \$ from 07/08 to 08/28



Increase of Watermelon Retail Sales in \$ in New England from 07/08 to 08/28

Years	Cut	Mini	Whole	Total
2012 v. 2011	21%	31%	20%	22%

Overall retail sales of watermelons in New England increased from \$298,008,693 in 2011 to \$362,116,185 in 2012 during the promotional period of this project. This increase of 22% in 2012 from 2011 surpasses the goal of a 10% increase in sales. Although the sales figures do not specifically represent watermelons from Maryland and Delaware, these states were the main source of watermelons in New England during the dates of the promotion. This data was provided by FreshLook Marketing.

Change in Movement & Revenue of MD & DE Watermelons 2012 vs 2011

	Prior to 7/23	7/23 to 8/26	Post Promo Period

Movement	-40%	+9%	+51%
Revenue	-47%	+8%	+92%

The actual promotional period including the radio advertising, took place from 7/23 to 8/26. We were unable to obtain this data specifically on the movement and revenue to New England, so these percentages represent all watermelon movement and revenue in Maryland and Delaware. Prior to the promotion, movement was down in 2012 compared to 2011. During the promotion it started to increase from 2011 by 9% in movement of watermelons and 8% in revenues. Where we see the most impact was after the promotion, movement was up 51% from 2011 and Revenue was up 92%. This increase in the post promotion period is a common trend seen in studies of watermelon promotions, which show that there is generally an impact lag of a month or two.

Goal 3 – Build interstate support for watermelon industry

Objective 3 – Develop strong working relationship between DDA/MDA to benefit watermelon farmers.

Outcome 3- A strong working relationship was formed between DDA/MDA to benefit watermelon farmers on this project. Both states were involved throughout the project, meeting every few weeks to discuss the project plan and progress. The partnership that was formed will continue to benefit Maryland and Delaware watermelon farmers moving forward as it has been determined we can do more by combining state resources, than each state on their own.

BENEFICIARIES OF PROJECT

The major beneficiaries of this project were Maryland & Delaware watermelon farmers and brokers. There are 50 independent family farmers who are members of the Mar-Del Watermelon Association that took advantage of the MAR-DELicious watermelon promotions in New England. Increased sales and demand for MAR-DELicious watermelons from New England was ideal as Maryland and Delaware have a shipping and “local” advantage over other watermelon producing states. In addition, New England grocery retailers who took advantage of the promotion benefited by increased sales of watermelons from Maryland and Delaware. For data and analysis on increased sales of watermelons in New England and increased movement and sales of Mar-Del watermelons please see the goals and objectives section above.

LESSONS LEARNED

Many lessons were learned during the course of this project. The first was that most of the watermelons in New England were from Maryland and Delaware from late to July to early September. This was due to the late growing season of the state’s watermelon farms as well as a shipping advantage over many of the other watermelon growing states due to proximity of the New England market. Another lesson that was learned is that while some Maryland and Delaware farmers sell directly to retail buyers, a majority go through brokers. This project definitely benefited watermelon farmers, however the impact may have been greater for the brokers. Future projects could be altered to increase the impact on the farmers themselves. One unexpected resource was the benefit of working with the National Watermelon Promotion Board. Through the NWPB we were able to take advantage of their booth at the New England Produce Council’s trade show, marketing materials they had already created, key contacts that they shared, and in-depth knowledge and experience from their staff. In addition another lesson learned would be to get greater commitment from partnering retailers to increase the success of the

project and its evaluation. While many retailers were closely involved in the project, others did not completely follow through on all of the aspects of the promotion. Also, due to the sensitivity of much of the information needed to evaluate the success of the promotion, many retailers opted out of providing sales figures during the project. Lastly, going into the project it was not as apparent how beneficial in-store promotions were to the project and its promotion. Through our in-store promotions, we were able to see firsthand the impact of the project and consumers were able to make a closer association between the advertisements they had heard and the benefits of purchasing MAR-DELicious watermelons. Many of the consumers we spoke with in the stores had heard the radio advertisements or seen the MAR-DELicious brand in retailer circulars, then seeing the in-store promotion with the Watermelon Queen really completed the message and persuaded them to purchase Maryland and Delaware watermelons.

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FINAL REPORT

Project Title: Monitoring and Management of Brown Marmorated Stink Bug in Processing and Fresh Market Sweet Corn

Project Summary

The brown marmorated stink bug (*Halyomorpha halys*) (BMSB) is an invasive insect that was introduced into the United States in the mid 1990s. Since its initial detection, it has spread to 41 states, posing severe agricultural problems in six states and nuisance problems in thirteen others. In the Mid-Atlantic region, BMSB became an agricultural problem in 2009 when damaging populations occurred for the first time in fruit growing regions of MD, WV and VA. In 2010, populations exploded throughout the region, causing severe damage in fruit crops, field crops, and many vegetables including sweet corn.

Sweet corn producers in central and western counties have reported significant ear quality losses due to stink bugs since 2010. On the Eastern Shore, feeding by stink bugs has been implicated as the cause of ear quality problems in the processing sweet corn industry. S.E.W Friel Cannery, a major Maryland company, experienced significant grade reductions from kernel defects in the raw product harvested from late season fields in 2011 and 2012. Adults and nymphs use piercing mouthparts to drill through husk leaves and insert their feeding stylets into individual kernels. In the process, they inject pre-digestive salivary fluids and then suck out liquidized contents of the kernels. Unlike the ear tip injury caused by ear-invading caterpillars, stink bug feeding can occur anywhere on the side of the ear. If kernels are slightly probed or partially consumed, they remain intact and not removed during processing. Injured kernels become discolored after blanching and show up as defects in grading of the processed product. For fresh market produce, BMSB damage is not distinguishable on the outside husk leaves but the brown kernels are clearly evident after the ear is husked and cooked by the consumer. Given the increased levels of stink bugs (BMSB and native species) observed in sweet corn fields, these pests have the potential to significantly reduce the grade of the processed product and marketability of fresh produce. If stink bug populations continue to increase, the ensuing losses in marketable product and additional control costs may seriously impact the economic viability of this important Maryland specialty crop.

Sweet corn is not a major host plant of BMSB in its native range in Asia, thus there was no information on its biology and damage potential in sweet corn prior to this project. Moreover, very little was known about monitoring and management of BMSB, when it invades fields, and how landscapes surrounding sweet corn fields influence its abundance. Additionally, population abundance of native stink bug species, mainly brown stink bug (*Euschistus servus*) (BSB), has increased in recent years and can also be potentially damaging to sweet corn. The goal of this project was to enhance the competitiveness of sweet corn producers and processing industry by developing a cost-effective and environmentally-acceptable strategy for managing stink bugs. Specifically, objectives were to: 1) determine the extent and characteristics of feeding injury by stink bugs at different sweet corn growth stages; 2) assess the incidence and phenology of stink bug infestations in sweet corn in relation to growth stage, planting date and field location; 3) examine the spatio-temporal patterns and infestation levels of stink bugs in sweet

corn fields in relation to surrounding crops, non-crop habitats and vegetative types; 4) develop an efficient monitoring program and effective management strategy; and 5) evaluate the knockdown and residual activity of candidate insecticides for stink bug control. Reported here are activities performed in 2012 studies, along with preliminary studies conducted during 2011 in anticipation of the block grant.

Although the project was funded for one year, we also used carry-over funds in 2013 to train processing company personnel to identify insect pests in the field and monitor kernel damage and grade reductions at the cannery.

Project Approach

Phenology and extent of feeding injury on sweet corn. Project leaders and assistants established sentinel plantings of untreated Bt sweet corn at six research farms (Salisbury, Wye, Upper Marlboro, Beltsville, Clarksville, and Keedysville) in 2011, 2012 and 2013 to monitor the seasonal phenology of BMSB infestations. Early and late season plots were sampled weekly from early July through September by inspecting plants and evaluating ear damage at fresh market maturity. None of the Eastern Shore plantings were infested with BMSB or showed evidence of stink bug feeding injury on the kernels. At locations west of the Bay, adults invaded during early tassel emergence, began feeding initially at the base of green tassels, and then moved to the developing ear. The highest BMSB infestations were present when developing ears were forming kernels. Adults, eggs and all instars of nymphs were present from silking to about two weeks after peak harvest. Late plantings that reached fresh market maturity in September and early October had no detectable stink bug infestations and no evident of ear damage. These plantings apparently avoided injury due to their close proximity to more attractive host plants, especially pod-forming soybeans.

Figure 1 shows the typical seasonal phenology and abundance of BMSB adults, egg masses and nymphs in untreated sweet corn at the Beltsville research farm. Stink bugs did not invade plants until the green tassel stage, which coincided with the appearance of first generation adults moving off tree hosts. Adults first fed on the green tassels that were fully emerged on July 13, and their injury to the base of tassels caused necrotic symptoms on 17% the tassels, which affected pollination and kernel fill. As the ears formed, adults were mainly found around the ear zone on July 20 and continued feeding on developing ears right up to fresh market maturity on August 3. The presence and progression of egg and nymphal stages indicated the sweet corn is a favorable reproductive host plant for BMSB. Sampling continued for two weeks after harvest maturity during which adults continued to feed and remain on plants. The density of 6.9 adult and nymphs per m² recorded on July 27 (one week prior to fresh market maturity) is equivalent to approximately 1.6 stink bugs per plant. The cumulative feeding resulting from this infestation density injured 98% of the ears and an average of 29 damaged kernels per ear. Much lower infestations can significantly reduce the grade of the processed sweet corn and marketability of fresh produce.

Further evidence of the damage potential of BMSB on sweet corn was documented in an early planting of untreated sweet corn at the Upper Marlboro research farm in 2011. This field was located next to a woodlot that served as the source of colonizing adults, and consequently plants were infested with an increasing gradient of stink bugs across rows leading inward from the field edge. At harvest, densities ranging from 0.2 to 2.6 stink bugs per plant were highly correlated with injury ranging from 5 to 54

kernels per ear. Regression analysis showed a significant relationship between BMSB density and kernel injury and predicted that a late nymph or adult caused an average of about 20 kernels.

Brown Marmorated Stink Bug Populations in Sweet Corn

Beltsville, MD 2011

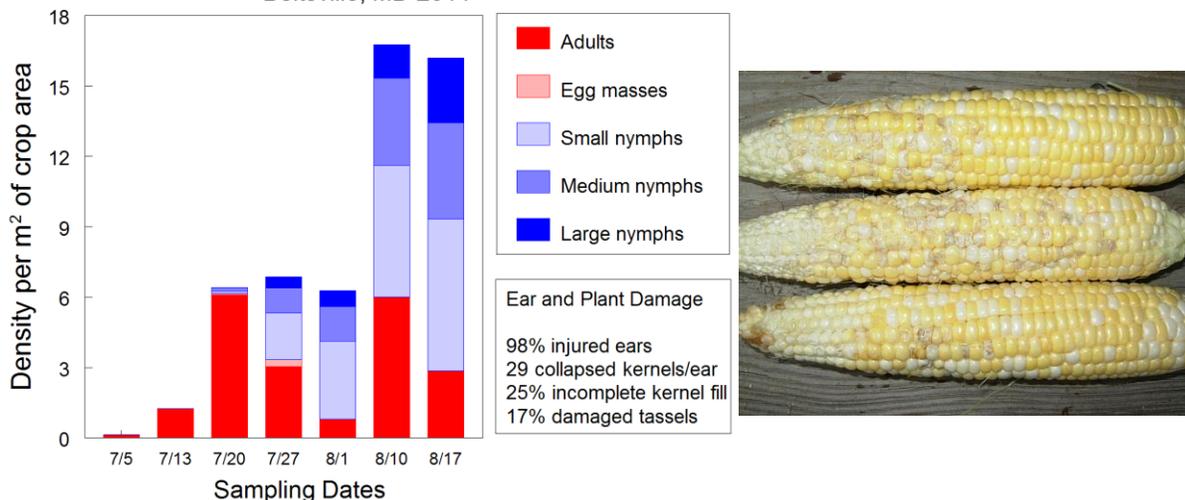


Figure 1. Seasonal phenology and densities of BMSB adults, egg masses and nymphs in untreated sweet corn. July 13 - tassels fully emerged, July 20 – full silk, August 3 – fresh market maturity, August 10 – processing maturity. Ears show collapsed and discolored kernels. Beltsville, MD.

Infestation levels and relative susceptibility of sweet corn compared to other host plants. BMSB is known to feed and reproduce on a number of vegetable crops, particularly legumes, in its native range in Asia. To effectively manage BMSB on farms where sweet corn is commonly produced in close proximity to other vegetable crops, we determined the relative attractiveness and susceptibility of sweet corn compared to five other vegetable crops (green bean, tomato, bell pepper, okra, and eggplant) in plots planted side-by-side along the field edge next to woods at three research farms in 2011 and 2012. Numbers of adult and nymphal stages were recorded weekly in each plot and adjusted to an absolute density per m² of crop area. Compared to other vegetable crops, sweet corn was the most attractive host plant and harbored the highest numbers of BMSB in terms of density per unit area of crop. Peak densities reached 16.8, 12.8, and 7.5 of all stages per m² at Beltsville, Upper Marlboro, and Keadysville, respectively. The most serious injury was caused by adults and late instar nymphs inserting their piercing-sucking mouthparts through husk leaves and into individual kernels.

To develop and implement monitoring methods to properly time and implement control measures against BMSB, project leaders and assistants first had to determine the incidence and distribution of BMSB infestations in commercial sweet corn fields. Friel Cannery and Syngenta Seeds cost-shared a monitoring project on approximately 7,000 acres of processing sweet corn grown on the Delmarva Peninsula. Cannery personnel assisted the project technicians in locating fields and provided daily reports of fields treated with insecticides. In 2011, 48 fields located throughout the Peninsula from Salisbury, MD to Middletown, DE were scouted, each visited several times starting at full tassel to detect initial invasion of stink bugs and subsequent infestations after insecticides were applied for ear-infesting caterpillars and sap beetles. The assumption was that BMSB would be likely found at field edges next to woodlots or adjacent areas with dwellings. To increase the chances of detection, sampling was targeted to these areas of each field. Each field inspection involved sampling sets of 10 consecutive plants at three sites, concentrating first on the second row (or 5 feet from the field edge if rows ran

perpendicular). Additional sets of plants were inspected on row 12 (or 30 feet from field edge) and row 22 (or 55 feet from edge) if the infestation extended farther into the field. Data were recorded as the number of adults and nymphs by species per 10 plants.

Native brown stink bugs (BSB) were found on the outer rows in 69% of the fields, while BMSB was detected in only one late planting around Middletown, DE. Infestations of the native species were relatively low, with numbers averaging 0.65, 0.11, and 0.06 adults/nymphs per 10 plants on rows 2, 12 and 22, respectively. Only 5 out of 48 fields had detections of stink bugs beyond 30 feet from the field edge. Despite low counts, counts of bugs after sprays suggested that stink bugs were suppressed but not completely controlled by the aerially-applied insecticide. Pooled over all rows sampled, stink bug counts averaged 0.52 per 10 plants prior to the first silk spray compared to 0.19, 0.26, and 0.27 at 1, 2, and 3 days post treatment. Counts were also related to some extent with the landscape features surrounding fields. Higher counts were positively correlated with fields with larger proportion of the perimeter bordering woodlots, whereas fields surrounded mainly by other crops and less woods had lower stink bug infestations. Surveys of 91 processing sweet corn fields sampled by project technicians in 2012 showed similar results. Eighty % of the fields had low levels of brown stink bugs found on the outer rows, particularly along field margins adjacent to woodlots. BMSB detections were confirmed in only two fields during late ear development in Dorchester Co. However, ear inspections in 2012 showed higher levels of sap beetle activity than did surveys in 2011, which was probably due to the very mild winter.

Blacklight traps were operated by project assistants at five research farms to record stink bug activity. Individual captures per night of BMSB adults are depicted in **Figure 2**. Total yearly captures in 2012 at Salisbury, Wye, Upper Marlboro, Beltsville, and Keedysville were 30, 65, 384, 235, and 105, respectively; an overall decline of about 90% compared to captures in 2011. Stink bug captures increased significantly in 2013, with yearly captures at Wye, Upper Marlboro, Beltsville, and Keedysville totaling 125, 415, 291, and 1844, respectively. The two Eastern Shore traps have consistently captured much lower numbers of stink bugs during the past four years. Moreover, random surveys of soybean fields over the past two years detected very low levels of BMSB, with most detections reported in upper counties of the Peninsula. Together, these results confirm that BMSB populations have not yet reached levels causing consistent damage to processing sweet corn or other row crops on the Delmarva Peninsula.

In-field patterns and surrounding habitat influences. Within-field distribution of stink bugs and any surrounding landscape influences on their distribution patterns is essential information for developing efficient monitoring procedures for sweet corn. Since BMSB and native brown stink bugs exhibit strong aggregations around field margins, Dilip Venugopal, a graduate student, investigated the influence of adjacent habitats on stink bug abundance at different distances from edges of fields. Surveys mentioned above showed that low levels of brown stink bugs were correlated to some degree with certain landscape features surrounding fields. Based on the overwintering behavior of BMSB and its early summer tree hosts, we hypothesized higher abundances of BMSB in fields adjacent to woods followed by buildings.

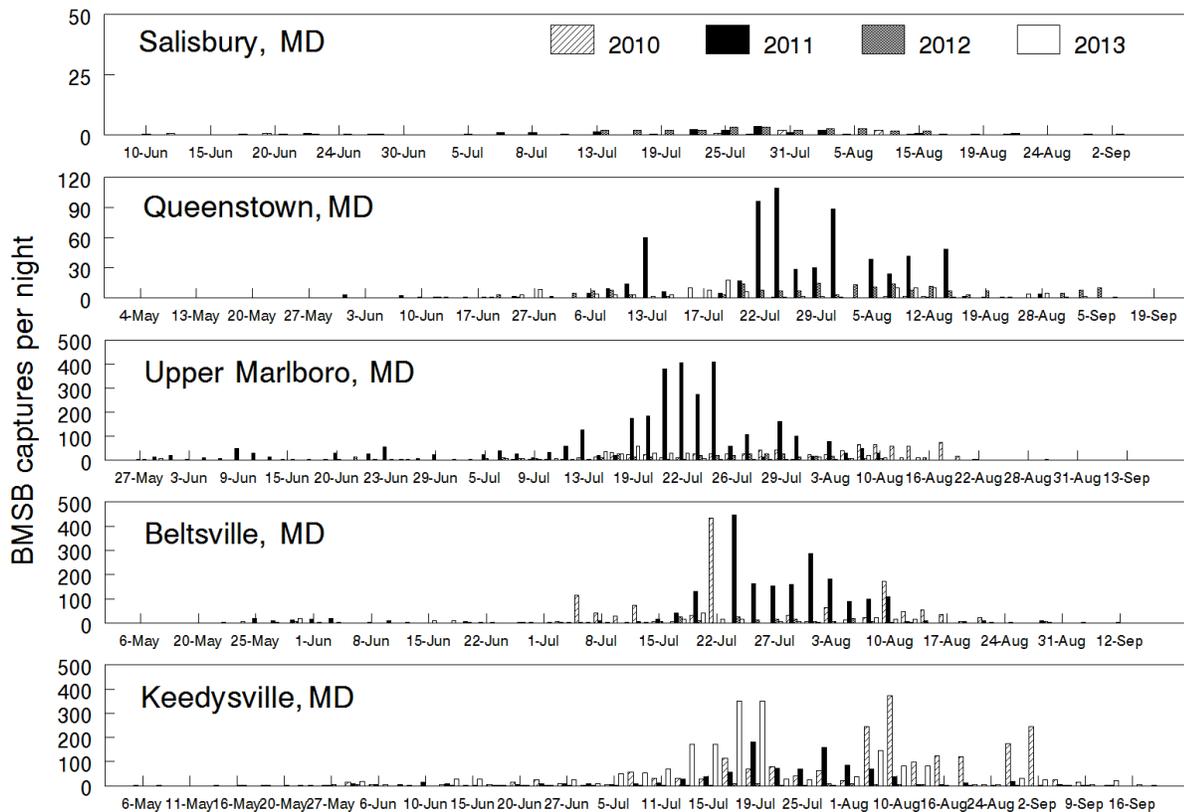


Figure 2. Captures per night of brown marmorated stink bug adults in trapping stations over the 2010, 2011, 2012 and 2013 growing seasons. Note the change in y-axis scaling for the Wye (Queenstown) and Salisbury sites.

To test this, we conducted studies in field corn at the Beltsville and Clarksville research farms, where BMSB populations were high enough to evaluate. Treatments included fields with habitats adjacent to corn comprising alfalfa, buildings, open, sorghum and woods. Stink bug counts were recorded on 10 consecutive plants at 0, 5, 10, 15, 20, 30 and 40 feet into the corn field from the edge. Fields were sampled 3-5 times between July-August 2012. The number of stink bugs observed was too low at Beltsville for any meaningful analysis. At Clarksville, statistical analyses revealed a significant interactive influence of adjacent habitat and distance from field edge (**Figure 3**). Overall, mean abundances of stink bugs observed was highest along woods, followed by alfalfa, buildings and sorghum. Comparison between the estimated mean numbers of BMSB observed along the adjacent habitats showed that abundance at each distance category was significantly higher along woods than alfalfa, buildings or sorghum. Also, mean abundances of BMSB was highest in the field edge rows and reduced significantly farther into the field. Although numbers of BSB were lower in these studies, spatial patterns of the native species were similar.

Several management implications for sweet corn fields can be drawn from these measurable outcomes. Results suggest that treatment decisions can be made by limiting monitoring for stink bugs to field edges, perhaps up to 60 feet into the field. Second, field edges along woods should be prioritized over other adjacent habitat types. Thirdly, treating the entire field may not be required if stink bugs are the

only target for control. However, sweet corn fields will likely be treated for other pests, so it essential to achieve good spray coverage on the outer margins of the fields where stink bugs aggregate.

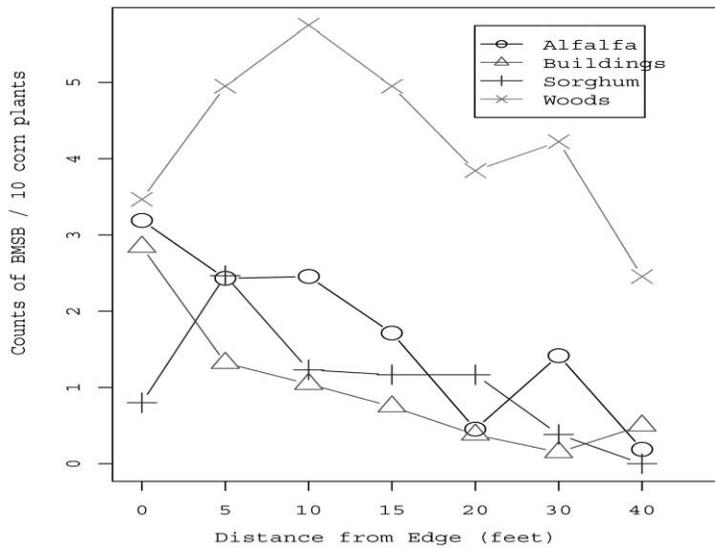


Figure 3. Plot of the mean number of brown marmorated stink bugs observed at different distances and along different adjacent habitats. Clarksville, MD 2012.

Potential impact of native stink bugs. Field surveys revealed that native stink bugs, mainly BSB, were considerably more abundant than BMSB in sweet corn fields. So it was necessary to expand the focus of the project to determine if this native species has the same damage potential as BMSB. To address this, an experiment was conducted at the Wye research farm by Bill Cissel, a graduate student at the University of Delaware. Manual infestations of 0, 1 and 3 adults of each species per ear were established in a late planting of Bt sweet corn. Project technicians and farm staff planted and maintained the field plots for the study. Replicate ears were infested at seven days prior to fresh market maturity by placing adults in nylon mesh bags over the ear and tied around the base of the ear shank. Bags remained on the ears until harvest on August 31, when each ear was examined to record the number of live adults remaining and then husked to count the numbers of discolored and sunken kernels. Mortality rates of both species were low and only a few adults were replaced during the infestation period. Statistically, there was no difference in kernel injury between the two stink bug species. Both species injured an average of 10.8 and 27.5 kernels at densities of 1 and 3 adults per ear over 7 days (**Figure 4**). Ninety-two % of the injury was characterized as discolored kernels, and only a few injured ones were sunken or collapsed due to internal tissue removal. Uninfested control ears also had an average of 6 discolored kernels per ear that were indistinguishable from the discolored injury in infested ears. This suggests that stink bug feeding may be difficult to distinguish from other types of damage or physiological stresses that could cause discoloration. In fact, this proved to be real problem in identifying causes of defective kernels in ears coming to the cannery.

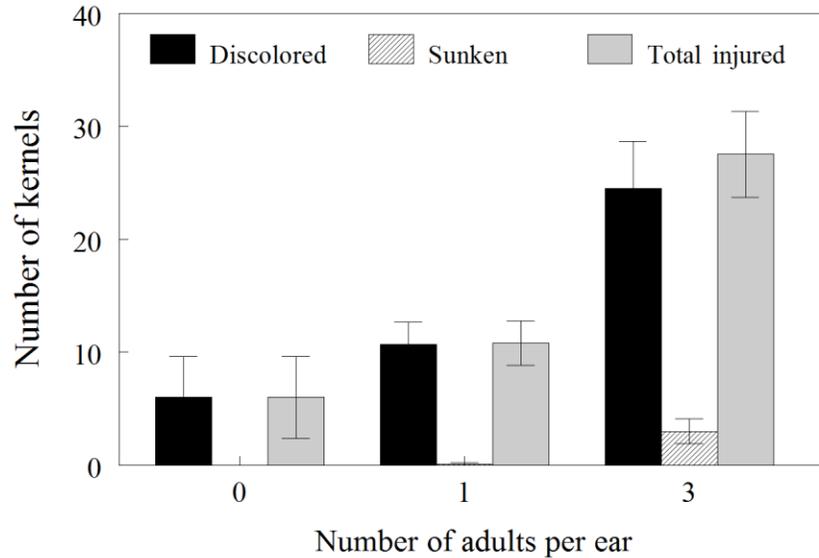


Figure 2. Mean number (\pm SEM) of damaged kernels caused by different densities of adult stink bugs feeding on individual ears for seven days. Means are pooled from data on brown marmorated and native brown stink bugs because their feeding injury and damage potentials were not significantly different. Queenstown, MD 2012.

Hypothetically, the potential impact of brown stink bugs can be estimated based on what we know about the rate of injury caused by one bug and average infestation levels observed in the sweet corn surveys. Pooled over all data from the outer 55 feet of the fields sampled, the density averaged 0.03 BSB per plant. Using the highest reported rate of 20 kernels injured per bug, an infestation at this density has the potential to damage 0.6 kernels per plant. The USDA acceptance limits for grade A canned whole kernel corn is 1 damaged kernels per 1000; higher levels result in B or lower grades. Assuming a single well-filled ear per plant with cut-off yield of 420 kernels (12 rows of 35 kernels each), 0.03 bugs per plant can potentially cause injury to 1.4 kernels per 1000. Thus, infestations of one bug in every 33 plants could cause kernel injury exceeding the grade A acceptance limits. The majority of sweet corn fields sampled in 2011 and 2012 exceeded this level of BSB activity at least on the outer rows. Obviously, these estimates are very conservative because many injured kernels will likely be removed from the finished product during processing. Furthermore, a much higher infestation on the outer field area would be needed to average one bug per 33 plants throughout the entire field. Nevertheless, these estimates demonstrate that BSB has the potential to cause significant injury, resulting in quality problems during processing.

Efficacy of insecticides for stink bug control. Research plots of sweet corn were established in 2012 to test the efficacy of insecticides for control of BMSB but infestations were too low to evaluate treatments. Instead, we evaluated a suite of registered products in a bell pepper study at the Beltsville research farm. Although spray volumes and delivery methods were different from the aerial application used on processing sweet corn, results are still relevant in terms of relative efficacy among treatments and residual activity.

Pepper seedlings were transplanted into black plastic mulch on 21 May, and the crop was maintained according to commercial practices. Nine treatments plus an untreated control were arranged in a randomized complete block design with four replicates. On 21 August, each treatment was applied using a CO₂ backpack sprayer calibrated to deliver 27 gal/acre at 40 psi. . Three hollow cone nozzles covered

each row, one directed on each side of the foliage and one over the top. Due to low natural populations, cohorts of 20 adults or nymphs were enclosed in a mesh bag and installed over plants in each plot on 23 August (2 days post-treatment). Counts of live, dead or moribund adults and nymphs were made 5 days later to evaluate the knockdown and residual activity of the treatments. Results revealed significant treatment effects on the number of alive, moribund, and dead insects (**Table 1**). Leverage, Baythroid, high rate of Vydate, Endigo and Warrior II were the most effective, affecting 71 to 86% of the exposed insects. Of these materials, Vydate at the high rate showed more knockdown activity as suggested by the greater proportion of dead insects relative to those that were considered moribund. Lannate, Lannate + Asana, and Vydate at the low rate were the less effective but significantly different from the control. PER-97 showed very little if any activity against BMSB.

Table 1. Effects on cohorts of brown marmorated stink bugs caged on treated plants at 2 days after application of different insecticides. Beltsville Research and Education Center. 2012.

Treatments	Rate/acre	Percent of stink bugs showing			Percent affected
		Alive	Moribund	Dead	
Leverage 360	3.8 oz	23.9 abc	30.3 a	45.8 abc	76.1 a
Baythroid	2.8 oz	14.4 ab	24.2 ab	61.4 ab	85.6 a
Vydate	1.5 pts	41.9 ab	1.1 bc	55.6 ab	56.7 ab
Vydate	3 pts	20.8 a	1.3 bc	82.3 a	83.6 a
Lannate	1.5 pts	67.0 bcd	2.1 bc	30.9 bcd	33.0 bc
Lannate + Asana	1.5 pts+6 oz	75.5 bcd	3.9 bc	21.9 bcd	25.8 bc
Warrior II	1.92 oz	29.4 abc	19.1 abc	51.5 abc	70.6 a
PFR-97 WG	1 lb	98.8 d	0.0 c	1.2 d	1.2 c
Endigo ZC	4.5 oz	13.8 a	12.3 abc	73.9 a	86.2 a
Untreated		86.8 cd	5.3 bc	7.9 cd	13.2 c

Mixed model SAS procedure was used to test for treatment effects and Tukey option was used to test for significance among multiple mean comparisons. Means within a column followed by the same letter are not significantly different ($P= 0.05$). Percent affected is the percentage of dead and moribund adults and nymphs. Significance of treatment effects: alive - $F_{(9,32)} = 19.9$, $P < 0.001$, moribund - $F_{(9,32)} = 5.6$, $P < 0.001$, dead - $F_{(9,32)} = 8.5$, $P < 0.001$, affected - $F_{(9,32)} = 19.4$, $P < 0.001$.

Goals and Outcomes Achieved

Outcomes of the field surveys achieved the performance goal and agreed with other monitoring efforts that BMSB populations have not yet reached levels causing damage to processing sweet corn on the Delmarva Peninsula. Field surveys revealed that native stink bugs, mainly BSB, were considerably more abundant than BMSB in sweet corn fields. Although brown stink bugs were found on the outer rows of 70-80% of the sweet corn fields sampled, there is still no conclusive evidence that these infestations were high enough alone to cause quality problems experienced at the cannery. Clearly, both stink bug species have the potential to significantly reduce the ear quality of sweet corn but their impact on processing sweet corn is still unresolved at this point. A more complete knowledge of all possible causal

factors (other insect pests and physiological stresses as well as stink bugs) is required to conclusively link stink bugs to grade reductions in the final processed product.

Altogether, the data generated both quantitatively and qualitatively provide a better understanding of the damage potential, within-field spatial patterns, and seasonal phenology of BMSB and other stink bugs on sweet corn. These results along with knowledge of how the surrounding landscape influences stink bug populations has enabled cannery personnel to make treatment decisions based on limited monitoring only at field edges, perhaps up to 60 feet into the field, and by prioritizing sampling efforts at field edges along woods over other adjacent habitat types.

After one year of the project, there is still much to learn before we can develop a cost-effective and sustainable strategy for stink bug management on sweet corn. However, the project did bring about some changes in the management practices used by the sweet corn cannery and individual producers. For processing sweet corn, repeated insecticide treatments for control of caterpillars are routinely applied during late tasseling and fresh silking and treatments usually stop 7 to 10 prior to harvest. Project results showed that stink bugs can invade sweet corn fields during this late ear development period of the crop cycle and cause significant kernel injury. As a preventative measure, the cannery added two or three extra spray applications per field in 2012 to their normal schedule on the later plantings to protect ears just prior to harvest. This added protection may be necessary in future years if stink bug populations continue to increase. Follow-up activities in 2013 also involved training cannery personnel in field monitoring to determine the stink bug species involved, timing and levels of infestations, and spatial patterns within sweet corn. We also trained quality control personnel at the cannery to monitor ear damage in loads of sweet corn prior to processing, in an attempt to identify the insect pests causing kernel injury and to link raw product quality to field infestation of known causal factors. Based on data collected in 2013, company personnel acknowledged that the major causal factor was probably sap beetles, followed by lepidopteran larvae and stink bugs.

Project results also demonstrated high levels of efficacy against BMSB with one application of many insecticides that are currently available to sweet corn producers. However, the knockdown effectiveness and residual period of activity may be different for treatments at lower spray volumes applied by air. Treating the entire field may not be required if stink bugs are the only target for control. However, sweet corn is routinely treated for other pests, so it essential to achieve good spray coverage on the outer margins of the fields where stink bug infestations are present.

Our targets for adoption of the monitoring practices and pest management practices were proposed to be completed by the end of the second year. However, due to the impediments' under Lessons Learned, we had one year of information instead of two years. We have received another Specialty Crop Block Grant under Agreement 12-25-B-1674 to continue the research. We did however provide a better understanding of damage potential, within-field spatial patterns, and seasonal phenology of stink bugs in order to implement an efficient monitoring program and made company personnel aware of what was needed to manage stink bugs in the most economical and effective way. We anticipate that the proposed goals and targets will be accomplished in the second year of the project.

Beneficiaries

Sweet corn grown for processing and fresh market is the major specialty vegetable crop in Maryland. Currently, about 18,000 acres were planted each year, with an estimated total cash value of \$26 million. Acreage figures over the past decade indicate that sweet corn is one of the fastest growing sectors of vegetable production in the state as well as the Northeast. In Maryland, there are approximately 480 farms that produce sweet corn, and 96 producers who contract with processing companies. This project was conducted as a collaborative partnership with S.E.W. Friel Cannery, Queenstown, MD and the Syngenta Seeds, who provided cash and in-kind matching support. However, sweet corn producers as well as consumers who buy and consume sweet corn have benefited from the project accomplishments.

Lessons Learned

One impediment to the completion of research objectives was the lack of sufficient BMSB populations at field sites for evaluation. We had to conduct several studies west of the Bay at farm locations and on crops besides sweet corn in order to address several objectives of the project. Another challenge is the fact that the impact of stink bugs on processing sweet corn on the Eastern Shore is still unresolved at this point. The processing company added extra insecticide applications as a preventative measure on the assumption that stink bugs were the target of control. However, a more complete knowledge of all possible causal factors (other insect pests and physiological stresses as well as stink bugs) is required to conclusively link stink bugs to grade reductions in the final processed product. Specifically, future studies need to obtain more quantitative information of the stink bug species involved, timing, levels and spatial patterns of field infestations, direct observations of feeding and associated kernel injury by stink bugs, and field-specific raw product quality data collected at the processing plant. Only then can we develop a cost-effective, environmentally-acceptable management strategy.

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