Specialty Crop Block Grant Program—Farm Bill

Massachusetts Department of Agricultural Resources

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FY 2012 Final Annual Performance Report

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Organization: Cape Cod Cranberry Growers' Association

Project Title: Phase 2: Empowering Growers with Water Quality Status of Ponds and Lakes Linked to Cranberry Bogs That may Require Phosphorus TMDLs

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PROJECT SUMMARY

This project invests in research that focuses on environmental outcomes and it supports the economic development potential and jobs of the cranberry industry. Phase 1 of this effort, funded by a Specialty Crop Block Grant program in 2010, was undertaken with UMass Dartmouth's Science and Marine Science Technology (SMAST) program. The Cape Cod Cranberry Growers' Association (CCCGA) and SMAST identified and sampled 20 ponds near cranberry bogs. SMAST determined that in Phase 1, "half of the ponds appear to have moderate to high resource impairment due to elevated phosphorus. This observation is also typical of ponds without cranberry agriculture in the region, so that accurate assessment of the cause of the enrichments would require a systems analysis."

This grant project would enable us to 1) develop more information to refine the potential extent of this issue, 2) provide more water quality data on selected ponds, and 3) develop the documentation to use any collected in regulatory settings. The Clean Water Act is dedicated to the protection and restoration of all waters of the United States. Within the Act are provisions requiring the identification and assessment of all public waters within each of the states. In Massachusetts, a list of these waters is prepared and revised every two years by the Department of Environmental Protection (MassDEP). This list, called the Integrated List, includes identification of all water bodies and river segments that fail to meet state water quality standards.

Any waters that fail to meet state standards are classified as "impaired" and are required by the Clean Water Act to have a Total Maximum Daily Load (TMDL) prepared. A TMDL document identifies the contaminant that is causing impairment and usually identifies the primary sources of the contaminant. TMDLs are approved by both MassDEP and the Environmental Protection Agency (USEPA) through a public process. Once a TMDL is approved, it is a regulatory document that must be addressed in applications for all state permits. Water quality standards are directly tied to the ability of a grower to utilize water for production practices. As such, growers may be required to meet certain water quality standards for their water withdrawal permits, which are issued every 5-10 years.

In Massachusetts, TMDLs are typically prepared by MassDEP, but are usually based on an

evaluation of the water body completed by experts outside of the state or federal regulatory agencies. There are exceptions, however, and several years ago MassDEP evaluated existing data and released a draft TMDL for White Island Pond in Plymouth.[1] This draft identified cranberry bogs as the primary source of phosphorus, the contaminant of concern in the pond.

This draft TMDL included the demand to apply a particular method for estimating the contribution of phosphorus from cranberry bogs to ponds and lakes.[2] This method, which is largely based on data collected from a study conducted by DeMoranville and Howes[3] (2005), allowed MassDEP to *generally estimate* the phosphorus contribution from the bogs rather than measure phosphorus contributions directly from individual bogs. We know from the results of the Phase 1 study that high levels of phosphorous appear in water bodies without cranberry bogs on them. MassDEP, in developing this method for estimating nutrient loading from cranberry bogs, appears to be signaling their intention to apply this method in the development of TMDLs for other ponds and lakes with associated cranberry bogs. We need the science to defend against potentially punitive regulations.

The summary conclusions from the SMAST report from the Phase 1 grant project on the first 20 ponds have convinced the industry that growers must take action to ensure that they have scientific documentation about the impacts of many different bogs on many different ponds and lakes. The following comes directly from the first study. "*The water quality results completed during this initial survey project show that a wide range of nutrient related quality conditions exist among ponds associated with cranberry agriculture. While most of the 20 ponds sampled have concentrations or conditions that fail to meet available thresholds or state regulatory standards, some are close to the available thresholds and cannot definitively be classified based upon a single sampling event. However, about half of the ponds appear to have moderate to high resource impairment due to elevated phosphorus. This observation is also typical of ponds without cranberry agriculture in the region, so that accurate assessment of the cause of the enrichments would require a systems analysis.*"

"The survey was conducted to assess the present status of the 20 ponds; it cannot be used to determine the source of the nutrient levels observed. However, as the nutrient enriched ponds have a variety of nutrient sources, including cranberry bogs, within their watersheds, there is clearly the potential for targeted regulatory actions related to compliance with the TMDL provisions of the federal Clean Water Act. At this time, it appears that MassDEP is going to approach individual pond assessments as the basis for TMDL development rather than pursuing generalized targets for whole regions. This is the most scientifically defensible approach.

[1] Draft Total Maximum Daily Load of Total Phosphorus for White Island Pond. April 14, 2009. DEP, DWM TMDL Report MA95166-2009-1 CN 330.0.

[2] Mattson, 2009. Guidelines for Total Maximum Daily Loads of Phosphorus from Commercial Cranberry Bog Discharges in Massachusetts. Massachusetts Department of Environmental Protection, Division of Watershed Management, Worcester, MA.

[3] DeMoranville, C.J. and B. Howes. 2005. Phosphorus dynamics in cranberry production systems: Developing the information required for the TMDL Process for 303d waterbodies receiving cranberry bog discharge. University of Massachusetts Amherst Cranberry Station, E. Wareham, MA and University of Massachusetts Dartmouth, School for Marine Science and Technology, New Bedford, MA. MassDEP 01-12/319. 137pp.

However, the most recent pond TMDL developed by MassDEP included management guidelines for cranberry bogs and the pond subject to the TMDL is part of a Memorandum of Agreement with the adjacent growers that specified grower nutrient management actions and annual phosphorus discharge limits. As an industry that is already regulated by MassDEP, it appears that cranberry bogs will be specifically targeted in pond and lake TMDLs in Massachusetts."

In Phase 2 of this study, CCCGA undertook more of the "systems analysis" mentioned in the Summary Conclusions of Phase 1 to conduct more snapshots and develop and refine the list of potentially impacted ponds and bogs. In order to ensure that all collected data can be used in regulatory discussion and to satisfy wary neighbors and watchful local governments, SMAST also developed a QAPP (Quality Assurance Project Plan) for collecting samples and analyzing data.

PROJECT APPROACH

1. Pond/Bog Database Development: SMAST created a database to be used in synchronizing the ponds with water quality data. The database has been established in MS-Excel format. No new ponds have been added since the initial creation in 2014 but will continue to be a resource for years to come.

2. QAPP Development: SMAST created a Quality Assurance Project Plan (QAPP) with involvement from CCCGA. The QAPP included sampling techniques for pond snapshot and bog discharges, lab detection limits/targets, equipment maintenance, QA/QC samples, and more. The QAPP was sent to MassDEP for approval and then encountered unexpected delays. We were informed that MassDEP does not review QAPPs for projects that they are not actively engaged in developing a TMDL. As a result, MassDEP introduced EPA into the review process, which procedurally would allow MassDEP to be involved in reviewing and approving, partnering with their de facto parent agency on the federal side. This enabled both EPA and MassDEP to be collectively involved in approving the QAPP. Both agencies provided feedback in the form of a revised QAPP. SMAST and CCCGA then considered the feedback, revised the QAPP accordingly and resubmitted for review and final approval from EPA/MassDEP. MassDEP, citing the significant and unexpected workforce reduction this past summer due to the state's early retirement offering, were left reeling with significant resources lost and a need to focus immediate efforts on pressing environmental matters. They notified CCCGA that they have temporarily set aside the QAPP approval until they have reestablished their personnel resources. They are committed to finalizing the QAPP but it may take several more months. CCCGA will remain committed to seeing through the approval of the QAPP.

3. Sampling & Lab Analysis: SMAST concluded the pond sampling in the first year of the grant project, following the procedures outlined in the draft QAPP, which was based on a previously approved QAPP. The following year, the laboratory analysis was completed and summarized in a technical memo (see Appendix A).

4. Technical Data Review & Reporting: SMAST created a draft technical memo for review by CCCGA and after some brief changes, finalized it in 2015 (see Appendix A).

GOALS AND OUTCOMES ACHIEVED

The first goal was to have a QAPP approved by MassDEP. That target has not been completely achieved but we expect that it will occur in calendar year 2016. MassDEP has already commented on the draft QAPP and all of their suggested changes have been incorporated into the most recent version awaiting their approval. As such, it should be more of a formality for MassDEP to approve the QAPP, especially since this QAPP is an iteration of a previously approved QAPP that has proven successful previously. Going forward, the cranberry industry can be assured that samples they take, with support from SMAST or a similar resource, can be considered reliable and acceptable to state regulatory agencies. This will enable growers to be proactive and can better understand the water body from which they draw upon or discharge. This will increase environmental awareness and help improve water quality. It can also assist with municipal or community members concerned over water quality by demonstrating with a science-based approach as to the quality of the water and the grower's awareness of the potential impact to the water, regardless if the water body is impaired or not. This will help build trust, community and environmental benefits.

The other stated goal was to have growers take responsibility for implementing phosphorus BMPs.
The first measurement was to have about 65% of CCCGA members currently use phosphorus BMPs. According to the grower survey conducted at 2015 CCCGA winter meetings, 87% of growers were following some or all of the Phosphorous BMPs as created by the UMass Cranberry Station. The 2015 survey indicated that 90% of the growers were using the recommended amount of phosphorous as outlined in the BMP, up from 86% in the 2014 survey. Compared to 10 years ago, 91% of the growers are now using less phosphorous in their nutrient management regime.

The next target was by the end of the contract, CCCGA will have provided education and one-on-one support to all members. CCCGA covered nutrient management BMPs, emphasizing phosphorous, as the 2013 – 2015 winter meetings, at the 2013-2015 Cranberry Station update meeting, with a direct mailing to all members of the BMP, and a bog side workshop at the Cranberry Station in 2014 to discuss nutrient management planning.

BENEFICIARIES

- The beneficiaries of this grant project are the close to 400 cranberry growers of Massachusetts, the industry itself, the regulatory community, the communities in cranberry country. Cranberries are grown in southeastern Massachusetts, Cape Cod and the island of Nantucket. There are about 30 towns with an active cranberry bog within their town border, 13,250 acres of cranberry bog in all. All of these communities have water bodies associated with cranberry farming and could benefit from the results. Those people that enjoy water bodies adjacent to cranberry ponds and the environment.

> There are millions of people worldwide that consume cranberry products. 30% of all cranberries grown are exported to foreign markets and with Massachusetts being geographically the closest to the largest export market, Europe, Massachusetts is the cranberry region with the most exported fruit.

The growers benefit as they now have a better sense for the condition of some of the ponds they utilize in their bog management system and if they were not part of the data collection, there is a procedure and process in place for obtaining scientific valid results. The growers are also more keenly aware of the phosphorous BMPs and the importance of following their recommendations. All of these benefits will assist the cranberry industry at large by having engaged and dedicated growers, improved water resources and renewed trust and support of regulatory agencies and the communities of which they live.

The regulatory community is now aware that the cranberry industry has a process in place for sampling water bodies, helping to reduce their workload. They are also aware of the significant increase in growers following the BMPs and dramatically lowering their phosphorous use.

The community benefits as growers are more keenly aware of the water bodies and their role in helping to keep them as clean as possible. This has always been the case but is even more heightened with the testing and BMPs as a result of this grant project.

Finally, the environment is going to benefit from this grant project. The waters have more attention cast upon them, their needs more immediately addressed. Growers on water bodies will know which ponds have water quality issues and those that don't. Following the BMPs will help all water bodies, regardless if they're impaired or not.

A study conducted by the University of Connecticut for Farm Credit East in 2014 estimated that the Massachusetts cranberry industry contributes nearly 7,000 jobs and $1.4 billion in yearly economic impact top the Massachusetts economy. Having access to clean water is part of the need for maintaining a sustainable cranberry farm in Massachusetts. This grant project is helping to insure that the water that is an integral part of the environment, used by the cranberry industry, and enjoyed by citizens and visitors alike can be maintained and improved over time. Determining an economic value to the environmental benefits that are a beneficiary of this grant project are difficult to obtain due to a high degree of other variables. Tourism, especially on Cape Cod, is a multi-million dollar business that will be aided by healthy ponds. Ponds that don't need costly improvements to increase water quality could potentially save millions of dollars to the local economy.

LESSONS LEARNED

One of the first lessons is that one cannot start a QAPP request with MassDEP without their explicit support first. Even though the need for a QAPP was done through a grant for environmental benefit, MassDEP's internal process does not allow for such a step. This may not be critical in the future but is sound advice for other cranberry regions looking to implement such

a program. Fortunately, there were no other negative aspects learned or encountered during the grant process.

Overall, the grant has been a positive tool for allowing the industry to reach more growers and educate them on the importance of the phosphorous BMPs and the condition of their water resources. This has raised awareness far beyond just the 20 ponds sampled in the grant plan. It can also be used as a springboard for developing future projects or programs involving water quality, nutrient management or similar needs. By taking a proactive approach, rather than waiting for a potential individual regulatory incident, the cranberry industry is now in a better position to plan for positive change to the environment in which our growers farm.

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Appendix A: Technical Memorandum (attached as PDF)

Organization: Massachusetts Farm Bureau Agricultural Preservation Corporation

Project Title: The Worcester Kindergarten Initiative: Focusing Parents and Students on Local Specialty Crop Specialty crops Farmer Connections

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1) Project Summary

Most U.S. children are not eating food they need to grow up healthy; in particular, they do not consume enough fruits and vegetables. The reason for this dearth of healthy produce in their diets can be tied to multiple issues for children living in low-income urban areas: lack of nutrition education (for children and caregivers); lack of information on where to find local, healthy products; and a lack of a connection to local farmers. Childhood obesity has become a national concern. At the same time, specialty crop producers struggle to stay in business. In 2010, in response to this challenge – and opportunity – the Massachusetts Farm to School Project and the Worcester Public

Schools, with Specialty Crops grant support, launched the Worcester Kindergarten Initiative.

The KI is a comprehensive nutrition education program that uses Massachusetts specialty crop snacks, take-home packages, farm visits, and family cooking demonstrations to teach young students about healthy eating and where their food comes from. It is a multi-sensory approach that combines a nutrition-focused curriculum with seeing, growing, preparing, and tasting local specialty crops.

The students and families who participate in the KI live in some of the lowest-income and most food insecure neighborhoods in Worcester. The schools we work in have an average of 90% of their student population eligible for free or reduced-price school lunch, meaning that approximately 90% of families at KI schools earn equal to or less than 185% of the Federal Poverty Level. And while the students are receiving healthy, locally sourced meals at school, in their lives outside of school local specialty crops are often not available.

But access to local specialty crops is increasing. Since the first year of the KI, farmers markets have popped up in Worcester in many of the neighborhoods where students in the Kindergarten Initiative live—there is even one that is mobile. Many local grocery stores have started to carry and label local foods and price them in affordable ways. As local, healthy food becomes more available to the families involved in the KI, the time is right to help increase their level of nutritional knowledge and ensure their connection to their local farmers.

As we enter our third year, we added in-class farmer visits and a mobile farmers market for the students, as well as school staff and the parents and caregivers of these very young students. More emphasis has been put on staff mentoring and parent involvement and connecting the specialty crops that their students see and taste directly to available sources of those same healthy, local products. Fostering multi-generational connections to local farmers ensures that families become enthusiastic consumers of healthy locally grown specialty crop foods for many years to come.

The 2010-2011 Kindergarten Initiative pilot opened a new chapter in nutrition and local agriculture education for Worcester, and all stakeholders – Mass. Farm to School, the Agricultural Preservation Corp., local specialty crop farmers, and the Worcester Public Schools—are committed to consolidating and strengthening the Initiative for the next school year. New relationships and habits were forged and the program is ready for a new "crop" of kindergarteners. The pilot program demonstrated that principals, teachers, cafeteria staff, and school administrators in Worcester are eager to use specialty crops as groundbreaking nutrition teaching tools. It also showed us that specialty crops farms in Worcester County are very interested in working with kindergarteners and in providing food for kindergarten snacks. The Worcester KI team is committed to building on the success of the pilot program, and we do not want to lose our momentum.

For the 2011-2012 school year the Mass. Farm to School Project built upon our work with Massachusetts specialty crop producers during the pilot program by tightening the

synergies between local food served in the Worcester Public School cafeteria, specialty local food classroom snacks, and the field trip destinations. Students visited farms that are already selling produce to the schools for school lunches, making stronger connections between their local specialty crop producers, what they grow, and where the students encounter it in their daily lives. The specialty crop taste-tests came from farmers that sell produce at farmers markets in Worcester, creating another connection for KI students and their families not only to local food in general, but to specific specialty crop producers to deepen all possible connections between producers and students in order to support farmers now, and foster future customers for specialty crop growers.

For this most recent Specialty Crops project, 2012-2013, we built further upon our existing work. Field trip destinations were pulled closer in toward Worcester to make them accessible to families for future visits and to more closely connect students to what "local" really means. More taste-tests and hands-on activities were added into the curriculum to build on our knowledge that tactile experiences make the most impact at this age. Our evaluation has become more focused directly on what we think is most important to measure in the program. We are connecting more with parents around what their students are learning in the classrooms, what specialty crop products they are bringing home, and where in Worcester they can find and buy these local products. Last but not least, with the help of Specialty Crop funding we have been able to grow the program from 300 students the first year to 335 the second year to 425 the third year to 700 the fourth year. We hope to reach all Worcester public school kindergartners and their families in the coming years.

2) The Project Approach

The original work plan for this Specialty Crops Grant, The Worcester Kindergarten Initiative: Focusing Parents and Students on Local Specialty Crop Farmer Connections went from September 15, 2012 through June 30, 2013 but were extended through October 31, 2013. This means that activities for school year 2012-2013 (Year 3 of the KI) were completed as a result of this grant, as well as many of the beginning activities for the 2013-2014 school years (Year 4 of the KI).

During Year 3 of the KI, approximately 425 kindergartners participated in: multiple specialty crop in-class taste-tests, regular in-class nutrition and local food lessons, farm field trips to specialty crop farms, visits from the mobile farmers market bringing local specialty crops to students and offering more for sale to their families, information for their families on where to find local specialty crops in Worcester and how to prepare them, and cooking demonstrations with their families featuring local specialty crop products. Students also received take-home packages of local specialty crops throughout the school year.

During Year 4 of the KI, approximately 700 kindergartners have so far participated in the first half of the activities mentioned above.

During both Years 3 and 4, KI staff coordinated extensive evaluation of the program, held meetings with the teachers involved for feedback and check-ins, and handled all of the logistics of working with the schools and the local specialty crop farmers to source snacks, plan field trips, and more.

Kindergarten students involved in the KI were exposed to local dairy and local grains, in addition to specialty crops, through in-class lessons and, in some cases, a visit to a Massachusetts dairy farm. But no Specialty Crop funds were used for any dairy-related events or activities—funding for all related in-class activities, taste-tests, and farm visits came from non-Specialty Crop sources.

Discussions of local dairy and grains were used in conjunction with discussions of local specialty crops when teaching students about the importance of supporting our local agricultural economy and enjoying locally produced foods. They were also used as part of activities about MyPlate and the various food groups we eat to keep ourselves healthy.

a) A summary of the contributions and roles of project partners.

The primary project partner for the Kindergarten Initiative is the Worcester Public Schools. Throughout the period of this Specialty Crop funding, they have been incredibly supportive of and excited about the KI. The KI Coordinator has met with grant writers at the schools and other administrators to discuss funding going forward and how we can tie together our fundraising efforts. The schools have expressed excitement about expanding the program to additional schools and kindergartners and have worked with Mass. Farm to School to create a Memorandum of Understanding to ensure we are all on the same page. The schools are translating KI materials free of charge to allow us to provide information to families in seven languages other than English, and some of our specialty crop taste-test snacks will be purchased with Fresh Fruit and Vegetable Program funding through WPS for the second half of Year 4.

Fertile Ground continued as our evaluation partner through Year 3, although we have brought the evaluation component in-house for Year 4. Their evaluation report for the school year 2012-2013 served as a valuable tool for adapting the curriculum, adjusting materials and activities, and working with teachers on implementation.

The Worcester Regional Environmental Council has served as an invaluable partner organization throughout Year 3 and into Year 4. They maintain a network of school gardens throughout Worcester (many KI schools have schools gardens built by the REC) and we have worked with them to grow our relationship and integrate the school gardens into the Kindergarten Initiative. Their mobile farmers market (housed in a renovated WRTA van and stopping in ten locations throughout Worcester on a weekly basis) was a great tool for teaching students about buying local produce—it was also fun for parents, family members, and school employees at each of our stops to see the market, purchase produce, and learn about where else in Worcester they can regularly buy local specialty crops. Farm visits in the fall of Year 4 were taken to the REC's two YouthGROW urban farming sites—driving home the idea of local for the kindergartners and their families and exposing them to specialty crop producer's right in their own neighborhoods. REC's Assistant Farm Manager, a young woman born and raised in Worcester, was the farmer who went into classrooms during Year 3 and answered student questions about farming.

The farmers that host farm field trips and sell produce for taste-tests, take-home packages, and cooking demonstrations continued to be integral partners in the KI. Wonderfully, many of the farms that students visit through the KI also provide produce for KI activities or sell to the Worcester Public Schools. During this grant period, the KI

interacted with 20 specialty crop farms in Massachusetts in different ways (see Section 3.a. below for lists of specialty crop farmers). While we strive to create additional avenues for income for these farms, they also provide an invaluable service to us by being excited to interact with very young students, allowing them onto their farms, explaining to them the benefits of local healthy eating, and even visiting students in their classrooms.

3) Goals and Outcomes Achieved

The original work plan for this Specialty Crops Grant, The Worcester Kindergarten Initiative: **Focusing Parents and Students on Local Specialty Crop Farmer Connections** went from September 15, 2012 through June 30, 2013 but was extended through October 31, 2013. This means that activities for school year 2012-2013 (Year 3 of the KI) were completed as a result of this grant, as well as many of the beginning activities for the 2013-2014 school year (Year 4 of the KI).

During the 2012-2013 school year, there were approximately 450 students served by the KI in 17 classrooms in 5 very low-income, urban public schools in Worcester, Massachusetts.

Throughout the year, students had five in-class taste-tests, six take-home packages of local specialty crops and information, and each classroom had at least two deliveries of classroom materials.

Students made fifteen separate field trips to four different specialty crop farms in the Worcester area: Breezy Gardens in Leicester, Clearview Farm in Sterling, Brigham Hill Community Farm in North Grafton, and KE Farm in Sturbridge.

Students tasted specialty crops from fifteen different Massachusetts farms: Clearview Farm in Sterling, Breezy Gardens in Leicester, Meadowbrook Orchard in Sterling, Bolton Orchards in Bolton, Green Roof Sugarhouse in Rutland, Red Fire Farm in Granby, KE Farm in Sturbridge, Brookwood Farm in Milton, Volante Farm in Needham, Verrill Farm in Concord, Blue Heron Farm in Charlemont, Czajkowski Farm in Hadley, Fairland Farm in North Attleborough, and Oakdale Farms in Rehoboth. Products were used for in-class taste-tests, take-home packages for families, and cooking demonstrations.

Students

For Year 4, the 2013-2014 school year, there were nine schools, for a total of twenty-nine classrooms and approximately 700 students.

During the first half of Year 4 (the period in which Specialty Crop funding was used), each school received a visit from the mobile farmers market that brought take-home packages of apples, pears, and peaches (when available). Produce came from Charlton Orchards in Charlton, Foppema's Farm in Northbridge, and Oakdale Farm in Rehoboth. The market also offered produce from Schultz Farm in Rutland for sale to families, teachers, and other school employees.

Most schools (there was difficulty scheduling a few) visited one of the two REC YouthGROW urban farm sites in Worcester for their fall field trips. While there they taste-tested cherry tomatoes and sweet peppers from various Worcester-area farms: Clearview Farm in Sterling, Harper's Farm in Lancaster, or Nicewicz Farm in Bolton.

In their classrooms, students all taste-tested applesauce and apple chips (from Clearview Farm and Schultz Farm in Rutland), vegetable soup (ingredients from Clearview Farm) and carrots in three different colors (from Red Fire Farm in Granby/Montague).

They brought home informational materials on the farms they visited, the specialty crops they tried and where to buy them in Worcester, and nutrition and recipe information.

Beginning of year KI Team Kickoff meeting 9/15/12

The beginning of Year 3 Kickoff Meeting was held at City View School on September 26, 2012. Teachers and principals from all five schools attended. The meeting included a review of the KI curriculum and pieces and a basic lesson on food systems and food in Worcester.

One delivery of classroom materials to each classroom 9/15/12

Dehydrators were delivered to classrooms at Chandler (the new school). The teacher booklets, updated curriculum, and appropriate worksheets were delivered to all teachers and principals at the Kickoff Meeting (or to their schools the following day if they were unable to attend).

Pre-curriculum evaluation completed at two KI schools and one non-KI school 9/30/12

Pre-curriculum evaluation was adapted slightly for Year 3, based on discussions with Fertile Ground. One non-KI school was evaluated and evaluation was conducted at three KI schools instead of two to provide a broader range of classrooms, and students were chosen at random from each classroom at the three schools to provide a broader range of students. Evaluations were completed on September 24 at Belmont (KI) and City View (KI), and on September 27 at Chandler (KI) and Wawecus (non-KI).

Farmers for trading cards selected and photographed, cards for farmers of fall semester field trips and in-class visits completed 10/1/12

Once schools determined which farms they would be visiting for fall field trips, the card for Rick Malone at Clearview Farm was updated and reprinted and a card for Kim and John Miczek at Breezy Gardens was created and printed.

Flyers promoting upcoming fall semester KI events and KI info, sources for local specialty crop products in Worcester, and info on KI farmers completed and distributed 10/1/12

Multiple flyers were created and sent home to parents this fall, including: information on the mobile farmers market in Worcester that stopped at each KI school (including an invitation to come the day of the visit), information on making roasted squash seeds from the pumpkins each student brought home, and a one-page flyer on the KI. All materials sent home were in English and Spanish.

One specialty crop taste-test snack distributed to each Year 3 classroom 10/1/12

Each classroom was given a pumpkin and a buttercup squash from the farm where they took their fall field trip (either Clearview Farm in Sterling or Breezy Gardens in Leicester), along with instructions for "roasting" squash seeds in their classroom dehydrators. The students got to participate in preparing the seeds and ate the seeds as their taste-test snack.

One visit to each school by the mobile farmers market 10/15/12

The Regional Environmental Council's mobile farmers market visited each school on one Friday afternoon, delivering bags of local apples (Meadowbrook Orchard in Sterling via New Roots CSA) to each kindergartner, giving them a tour of the vehicle, and remaining after dismissal to sell local produce from Schultz Farm in Rutland to parents, families, and school staff. The visits were: at Chandler on September 14, at Woodland on September 21, at Belmont and City View on September 28, and at Elm Park on October 12.

Farmer trading cards for fall semester distributed to classrooms 10/15/12

Trading cards for the farm/farmer each school visited (Clearview in Sterling or Breezy Gardens in Leicester) were given to each school on the day of their fall field trip. The cards were distributed to students by their teachers either that day or the day they took home the pumpkins each student received on their fall field trip.

One delivery of classroom materials to each Year 3 classroom 11/15/12 Sets of recipe cards in English and Spanish were produced by the Community Harvest Project and distributed to all classrooms in early October for use in their Food Day classroom activity.

Two take-home produce packages sent to all kindergartners' families—one containing produce from mobile market, one containing products from kindergartner taste-test 12/1/12

All students took home a bag of apples delivered by the mobile market from Meadowbrook Orchard in Sterling. They also brought home a sugar pumpkin from the farm that each school visited (schools that visited Clearview Farm in Sterling received Clearview sugar pumpkins, schools that visited Breezy Gardens in Leicester received Breezy Gardens pumpkins) to recreate their pumpkin seed taste-test at home.

One farm field trip taken by each school 12/1/12

Chandler visited Breezy Gardens in Leicester on October 18, Belmont visited Clearview Farm in Sterling on October 19, Woodland visited Clearview Farm on October 25, and both Elm Park and City View visited Breezy Gardens on October 26.

Two cooking demos completed—one at each of two schools 12/15/12 Woodland held their cooking demonstration on December 13 and Chandler held theirs on December 14. At both demonstrations we made and ate acorn squash pancakes (Breezy Gardens acorn squash), drank apple cider (Bolton Orchards in Bolton), and tasted local maple syrup (Green Roof Sugar House in Rutland).

One specialty crop taste-test snack distributed to each classroom 12/15/12 In November all classroom taste-tested colorful carrots from Red Fire in Granby—orange, yellow, and purple!

Mid-year KI teacher team meeting 12/15/12 Because of illness, this meeting was pushed back to January and was held on January 10. Teachers from the KI schools met with the Coordinator and evaluators to talk about the results of the teacher survey completed in December.

Flyers promoting upcoming spring semester KI events and providing information on the KI, sources for local specialty crop products in Worcester, and information on the farmers participating in the KI completed and distributed 1/1/13

While these handouts were being created by January 1, 2013, they will not be finalized and sent home until closer to each of the event dates to have the most impact on families. As of the end of this phase, a handout on kale chips and where to find local kale in Worcester was sent home to all students.

Trading cards for farmers of spring semester field trips and in-class visits completed and distributed to classrooms 1/1/13

Trading cards for Community Harvest Project's farm, where all students will visit at the end of the year, are in process but will not be completed and distributed until closer to the end of the school year and the farm visit.

Mid-year report completed and distributed to Worcester Public School administration, principals, and teachers 1/1/13

The Mid-Year Report was completed and distributed to appropriate Worcester Public Schools personnel in December 2012.

One delivery of classroom materials delivered to each classroom 2/15/13

Baggies, olive oil, and salt to do the kale chips activity were distributed to each classroom in early February and Chandler elementary received additional classroom handouts for spring semester activities.

One visit to each classroom by a specialty crops farmer 3/1/13

Kassy Ocasio, Assistant Farm Manager for an urban farm in Worcester, visited each classroom to talk and answer questions on January 28, January 31, February 1, and February 4.

One specialty crop taste-test snack distributed to each classroom 3/15/13

All students taste-tested kale chips (and raw kale) from Oakdale Farm in February.

One farm field trip taken by each class 3/15/13

Because of bad winter weather our spring farm visits were pushed back to the end of March and into April. Chandler visited KE Farm on March 28, and City View on April 5. Elm Park, Belmont, and Woodland visited Whittier Farms on April 11, 12, and 24, respectively.

One delivery of classroom materials to each classroom 5/1/13

Seed-starting materials were distributed to all classrooms during the first week in May. This included snap pea seeds, window boxes, soil, trellises, and planting instructions.

One specialty crop taste-test snack distributed to each classroom 5/15/13

All students taste-tested a "parts of the plant" spring salad in early May. This included: carrots from Brookwood Farm, asparagus from Volante Farm, spinach from Verrill Farm, dried cranberries from Fairland Farms, and maple syrup from Blue Heron Farm (in the salad dressing).

Post-curriculum evaluation of students, teachers, and families begins 5/31/13

In-class post-curriculum student evaluations were held at one KI school and the control school on May 30 and at two additional KI schools on June 3 (part of Phase IV). End of year family surveys were created in this phase but were sent home on June 4 (part of Phase IV). End of year teacher evaluation is being planned and will happen during Phase IV.

End of year KI teacher team meeting 6/1/13

All teachers completed end of year surveys and one on one conversations were held between teachers and the KI Coordinator, but it was decided that an end of year meeting for everyone was unnecessary.

Two chef cooking demos completed at remaining two schools 6/1/13

City View held their cooking demonstration on April 24 and Belmont held their cooking demonstration on May 28. At City View we made and ate carrot pancakes (Brookwood Farm carrots) and at Belmont we made and ate parsnip pancakes (Czajkowski Farm parsnips) and at both we tasted local maple syrup (Green Roof Sugar House in Rutland).

One farm field trip taken by each class 6/15/13

Every school visited Brigham Hill Community Farm, run by the Community Harvest Project, in North Grafton in May or June. Woodland went May 30, City View went June 4, Belmont went June 7, Elm Park went June 10, and Chandler went June 11.

Survey of local farms that participated in KI completed 6/30/13

An informal survey of farmers was completed by the KI Coordinator and the Evaluation and Education Specialist. Each farmer was asked about their thoughts on selling to the KI, having kindergartners visit their farm, or whatever their connection to the KI was; their interest in continuing the relationship into the next KI year; their interest in growing their relationship in the

next KI year; and their interest in being connected with the Worcester Public Schools for wholesale sales, where appropriate.

2012-2013 evaluation results compiled 7/31/13

Fertile Ground compiled the results of all school year 2012-2013 evaluations and provided Mass. Farm to School Project with that report in mid-July.

Complete review and evaluation of the prior years' curriculum. Update the curriculum for 2013-2014 year 8/15/13

The KI Coordinator and Evaluation and Education Specialist spent a great deal of time over the summer going through evaluation results from 2012-2013 and making updates and changes to the curriculum for 2013-2014. These changes were finalized in mid-August.

One delivery of classroom materials to each classroom 9/15/13

All classrooms received a package of all materials that they did not already have needed to do the classroom activities and an updated curriculum and teacher booklet in late August, just before the beginning of the 2013-2014 school year.

Hold beginning of the year meeting for Kindergarten Initiative participants 9/30/13

The Year 4 Kickoff Meeting was held September 11, 2013 at City View School. Teachers and principals from all nine KI schools discussed updated information and curriculum, attended training on the program and Worcester school food service in general, offered ideas for the year going forward, set personal and program goals, and networked with each other.

Conduct Pre-curriculum student evaluations 9/30/13

The Evaluation and Education Specialist conducted pre-curriculum student evaluations at four KI schools (two existing and two new for 2013-2014) and one non-KI control school in September. Evaluations were held at Woodland on September 16 (existing), Burncoat on September 17 (new), Chandler on September 18 (existing), Chandler Mag on September 19 (new), and Vernon Hill on September 20 (control).

Complete beginning of the year family evaluations 9/30/13

Beginning of the year family evaluations were created and distributed with initial information packets to all families the first week of school in English and Spanish. Surveys were returned in mid-September and results compiled.

Perform one specialty crop taste-test snack at each classroom 10/1/13 Students made and taste-tested applesauce and apple chips with apples from Clearview Farm in Sterling and Schultz Farm in Rutland the third week of September.

The mobile farmers market shall visit each school 10/15/13

The mobile market visited all nine schools and brought local apples, pears, and peaches (when available) to the students for a take-home. Visits were on September 20 and 27, October 4 and 18, and November 2

Create, print and distribute flyers promoting upcoming fall semester KI events and providing information on the KI, sources for local specialty crop products in Worcester, and information on the farmers participating in KI 10/15/13 All students took home a beginning of the year package of information on the KI and where to find local foods in Worcester, a farmers market flyer. Each KI event throughout the fall was advertised to families in advance so that they could attend or at least be informed. With their take-home apples and pears, students received information on what farms their produce came from and where in Worcester they could buy from those farms.

Conduct one farm field trip taken by each class 10/31/13

Six of our nine schools visited REC YouthGROW urban farms this fall (three were unable to schedule their visits because of timing or behavior issues). Belmont went on October 1, Chandler went on October 3, Chandler Mag went half on October 9 and half on October 10, Burncoat went on October 9, Grafton went on October 15, and Wawecus went on October 17.

e) Summarize the major successful outcomes of the project in quantifiable terms

Goal 1: To increase the understanding of 350-400 kindergarteners about how food grows, what can be grown in Massachusetts, and who grows it over the course of the 2012-2013 school year (Sept. 2012-June 2013).

Performance measure: We will do pre- and post-curriculum evaluations at two schools with questions about which fruits and vegetables can be grown in Mass., whether certain items are fruits or vegetables, and whether they have any experience growing food or visiting farms.

Benchmark: Benchmarks will be determined by the pre-curriculum evaluation.

Target: 80% of students evaluated at the end of the year will be able to identify which products can be grown in Massachusetts and 80% will be able to connect a farmer to a specific product.

Outcomes: Evaluation was conducted at three KI schools and one control school, with approximately 20 random kindergarten students at each school given pre- and post-curriculum assessments. While we did not reach 80% identification of products grown in Massachusetts, student understanding did increase significantly from the beginning to the end of the school year. At the beginning of the year, 36% of KI students thought that strawberries grow in Massachusetts and 29% thought that apples grow in Massachusetts. At the end of the year, 64% of KI students thought strawberries grow in Massachusetts and 55% thought that apples grow here—both significant increases.

While we did not have a question on our pre- and post-curriculum student assessments related to student understanding of connecting a farmer to a specific product, we have a great deal of anecdotal data from farm visits and taste-tests that show students can connect specific farmers to their products. Farmer Ernie, from KE Farm, was mentioned by many students when we taste-tested maple syrup later in the spring—they wanted to know if this was from his farm because they remembered visiting him there. While eating squash pancakes at a cooking demo in December, many students remembered the farmers at Breezy Gardens and Farmer Rick from Clearview Farm and wanted to know if these were the pumpkins (we were eating acorn squash but they remembered the pumpkins) that they saw those farmers growing when they visited. It is clear to us that meeting the farmers in person and visiting the farms, if possible, makes the

greatest connection in students' minds between local farmers and the specialty crops that they produce.

Goal 2: To increase the awareness of the parents and caregivers of 250-400 students involved in the KI about where their food comes from, who grows it, and where they can obtain local specialty crops by the end of the 2012-2013 school year.

Performance measure: We will do a post-curriculum survey of all parents and caregivers.

Benchmark: The data available from the previous year's parent evaluation is incredibly limited and cannot serve as a benchmark.

Target: 75% of parents evaluated at the end of the year will be able to identify one local farm and one local farmer that they can purchase products from and will be able to identify which products that farmer produces, 50% of parents will indicate that they will seek out a local specialty crop producer to purchase fruits and vegetables during the 2013 growing season.

Outcomes: End of year family surveys were distributed to all 425 families near the end of school year 2012-2013. 100 surveys were returned to us completed and with very positive results. Of the families that completed surveys, 75% have been to a farmers market in Worcester, up from 56% who reported they had been to a farmers market in Worcester before their student went through the Kindergarten Initiative program. 79% of respondents also correctly listed at least two items that they would expect to find at a Worcester farmers market (and that are locally produced specialty crops). 79% have also noticed an increase in their student's curiosity about food since the beginning of the KI program and 40% noted that their kindergartner has asked for specific foods they have tried at school through the KI program—foods that are specialty crops produced by local, Worcester-area farmers connected to the KI.

Goal 3: To increase the school-related sales and income of at least eight (8) Massachusetts specialty crop farmers.

Performance measure: We will collect data on farmer income as a direct result of KI activities: entrance fees paid for field trips; stipends for in-class visits; products bought for taste-tests, cooking demos, or take-home packages. We will also gather information from WPS about specialty crop farmer income from school sales as a result of their involvement in KI.

Benchmark: We will ask farmers at the beginning of the school year about any prior income from activities like the KI activities and will get data from the WPS about prior farmer income from school sales.

Target: In aggregate, the farmers surveyed will experience a 20% increase in Worcester Public Schools-related sales by the end of the 2013 school year.

Outcomes: During the contract period (September 15, 2012 – October 31, 2013), the Kindergarten Initiative sourced from or visited twenty Worcester-area specialty crop producers. (See Section 3.a. for more information on all of these farms.) Through these interactions, farmers received ~$14,000 of direct income: $6,600 from farm visit entry fees, $250 from farmer in-class visit stipends, and more than $7,000 in local specialty crop purchases for cooking demos, in-class taste-tests, and take-home produce packages.

The value of sales from farmers involved in the Kindergarten Initiative to the Worcester Public Schools is harder to quantify, as numbers are not immediately available from the schools. The schools have reported that, since the beginning of the KI, they have spent more than $10,000

purchasing specialty crops for snacks from farmers involved in the KI and that they have spent more than $50,000 purchasing specialty crops for meal service from farmers involved in the KI.

4) Beneficiaries

The beneficiaries of this project are many and include:

- Approximately 400 (enrollment fluctuates slightly throughout the school year) kindergarten students in four of the lowest-income schools and neighborhoods in Worcester during Year 3, and 700 kindergarten students in five of the lowest-income schools and neighborhoods in Worcester during Year 4
- The more than 1,000 parents, caregivers, and family members of these students that will be involved in aspects of the program or indirect beneficiaries of what their students are learning
- Staff of the Worcester Public Schools: teachers, aides, food service personnel, and principals at each KI school, as well as food service and curriculum personnel and administrators
- Local farmers: Students visited five area specialty crop farms; snacks, cooking demonstration ingredients, and take-home package produce were purchased from twenty area farms. The KI has increased awareness of and loyalty to local specialty crop farmers not only in the students, but certainly in their parents, their teachers, and other teachers in the KI schools, principals, school administrators, food service personnel, and anyone else connected to the program. The farmers with whom students and other participants will have direct contact should see increases in their retail sales throughout the seasons to come.
- Local farmers market farmers: There farmers markets in Worcester every day of the week except Sunday (including the mobile market stops) and each has at least three area farms represented—increased knowledge about local products should equal increased demand for those products. As a result of increased interest in the Worcester farmers markets as a whole, the specialty crop producers who sell at those markets (even if they are not involved in KI) should also see an increase in sales.

See Section 3.e. above for more detailed information on financial benefits to local specialty crop farmers.

5) Illustration of the lessons learned as a result of completing this project

After many discussions with teachers and students around with “local” means to kindergartners, we have placed much more emphasis on sourcing from farms that are as close as possible to Worcester and that sell in Worcester and in bringing students to farms that are close to Worcester. If a student gets on a bus, even if the ride is only 15 minutes, their understanding of how local that is totally different than what an adult might think. For Year 4 fall farm visits all students went to farms within Worcester—some even walked! This focus on the immediate Worcester food environment has helped the students understand local and has helped their families find local specialty crop producers as close to home as possible.

As the final take-home of Year 3 all students received $5 gift certificates good at the farmers markets in Worcester. At the end of this year's summer farmers market season, all the certificates that had been redeemed were returned to us, with disappointing results—only a few of the 425 families had redeemed their certificates. As a result of this we are doing a lot more promotion of the farmers markets in Worcester earlier in the year. In fact, we are doing significant outreach to parents early in the year about all of the topics of the KI. Family packets were sent home the first week of school with information about the KI and information about where to find local specialty crops in Worcester. Our hope is that this increased knowledge will lead to higher redemption of the gift certificates and higher overall attendance at local farmers markets where Worcester-area specialty crop producers sell.

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Organization: Mass. Farm to School

Project Title: Digging Deeper: More Specialty Crops in More Cafeterias For More Of The Year

FY 2012 12-25-B-1467

Final Report:

1) A Project Summary

a) Background of the initial purpose of the project, including the specific issue, problem or needs that was addressed by the project

The Massachusetts Farm to School Project is a statewide initiative that seeks to increase consumption of locally grown food in schools, colleges, hospitals, and other institutions for the good of our farms, our consumers, and our communities. We simultaneously support Mass. specialty crop growers and improve child nutrition by facilitating purchasing relationships between farms and school cafeterias. "Digging Deeper" was designed to increase the amount of local specialty crops procured by institutions through targeted training and technical assistance to producers and institutional buyers as well as the launch of a 6-month promotional campaign, Harvest of the Month.

b) Description of the importance and timeliness of the project.

Mass. Farm to School is now in its 10th year of supporting farm to institution sales. While the movement has grown rapidly over this time, there are both clear barriers to growth and opportunities to address these challenges. Many growers remain unfamiliar with the unique attributes of the institutional sector, which may have different food safety, insurance, or logistical requirements than their existing markets. Many schools remain overwhelmed by the message to "buy local" and do not know where to begin their local procurement or, if they are already doing some local procurement, how to expand their efforts. The Harvest of the Month campaign provides a clear framework for local procurement. It also helps farmers enter the institutional

- c) If the project built upon a project that previously received Specialty Crop Block Grant, describe how the project complemented and enhanced previously completed work.
- Digging Deeper: More Specialty Crops in More Cafeterias for More of the Year built upon several years of support from the Specialty Crop Block Grant program to Massachusetts Farm to School. This support, beginning in 2009, enabled provision of training and technical assistance to Mass. specialty crop growers and provided limited promotion materials. Harvest of the Month is a 6-month campaign that grew out of our successful Harvest for Students Week. Through launching the Harvest of the Month campaign, we have now created a framework through which a wider number of schools and institutions can expand their local fruit and vegetable procurement programs. By offering this marketing and educational campaign, we lower the barriers to entry for institutions and provide farmers with clear advanced information about anticipated demand for their crops. Successful implementation of a Harvest of the Month campaign highlights the maturity of the farm to school movement in Massachusetts.
- In addition, the inclusion of specific research and outreach to state agencies represents a growth of our target audience. We are taking the lessons learned through nearly 10 years of providing assistance to the schools to a new market place with unique procurement challenges, but one which represents significant sales opportunity for Mass. specialty crop growers.

2) The Project Approach

a) A brief summary of activities performed and goals and / or targets achieved throughout the entire grant period. This should represent the activities/ goals and targets specified in Attachment B: Work Plan

This project took a multi-pronged approach to increasing the procurement of locally grown specialty crops by schools and other institutions. We worked to increase demand by launching a 6-month promotional campaign called Harvest of the Month. We provided training for school food service directors on how to procure and promote locally grown specialty crops. We also broadened our training to include additional school food stakeholders such as principals and business managers to create additional support for local procurement.

We provided a series of 4 trainings for specialty crop growers to help them access the institutional market, including exploring pre-season crop planning to meet the institutional demand created by the Harvest of the Month campaign. These group trainings were

complemented by extensive individualized technical assistance for both growers and food service directors.

Finally, we conducted extensive research on the opportunities and barriers for local foods procurement by state colleges and agencies and developed clear policy recommendations to overcome these barriers.

b) If the project benefited commodities other than specialty crops, indicate how the Contractor ensured that grant funds were used only to enhance the competitiveness of specialty crops

All workshops targeting farmers were focused on fruit and vegetable growers. All crops included in the Harvest of the Month campaign are specialty crops.

c) A summary of the contributions and roles of project partners

Collaboration with project partners was crucial to the success of this project. Our strong relationship with the School Nutrition Association of Massachusetts has aided in reaching our target audience of school food service directors. SNA-Mass. has sent out e-blasts about Harvest of the Month and provided the opportunity for us to write a newsletter article on Harvest of the Month that reached their full membership. We were also able to reach many food service directors with our Harvest of the Month display at the annual SNA-Mass conference. The Department of Elementary and Secondary Education is an additional partner that aids in communicating with school nutrition professionals. Similar support from the Mass. Dept. of Agricultural Resources (MDAR) has helped us better communicate with farmers. MDAR's outreach tools, such as the monthly Farm and Market Report, were used to advertise opportunities for farmers to sell to schools, including specific information about selling Harvest of the Month crops.

Partnership with the Farm to Institution New England collaborative and the Harvard Food Law and Policy Clinic strengthened our work with state colleges and agencies. Harvard provided extensive legal research on the efficacy and implementation methods of local procurement legislation and made specific policy recommendations. Farm to Institution New England provided a platform for sharing best-practices with peer leaders and a wider forum for distributing our findings.

Project partners supported the outreach and promotion of our workshops for specialty crop producers. These workshops were held in partnership with the New Entry Sustainable Farming Project, Boston Urban Agriculture Conference, Northeast Organic Farming Association, and Mass. Department of Agricultural Resources. Local partners facilitated the successful regional workshops including Sustainable Cape and SPIFFY a coalition of over 60 community partners in Hampshire County.

3) Goals and Outcomes Achieved

a) A description of the activities that were completed in order to achieve the performance goals and measurable outcomes identified in Attachment B

TASK	COMPLETED BY	STATUS
Launch project. Work plan responsibilities and duties delineated.	9/30/12	Completed – Have allocated staff time and created a master document, which is updated monthly with progress reports, outlining project timeline, deliverables and responsible staff person(s).
Organize college outreach campaign and designate priority campuses for technical assistance.	10/31/12	Completed - Farm to Cafeteria team reviewed surveys and technical assistance work of Massachusetts colleges and universities, updated food service management company information by campus, conducted outreach to college dining service directors, and identified 6 target campuses based on demographic factors including location, size and management structure. Colleges which received intensive technical assistance are: UMASS-Lowell, UMASS-Amherst, Framingham State, Worcester State, Bunker Hill Community College, and Greenfield Community College, representing a range of sizes, geographic locations, and food service management company contractors.
Research qualifying state agencies under preferential purchasing legislation.	10/31/12	Completed - Worked with the Harvard Food Law and Policy Clinic to review legislation and map out the agencies that do significant food procurement and the responsible purchasers at these agencies. Interviews conducted with procurement officers at Operational Services Division and Dept. of Corrections and communication with the Nutrition Coordinator at Dept. of Public Health.
Designated targeted low-income school districts for special assistance.	11/30/12	Completed – Farm to Cafeteria team researched potential low income districts based on factors such as size, location, current procurement practices, and previously expressed interest in local purchases. Have chosen to focus on select “gateway cities” including Lawrence, Salem, Worcester, Springfield, Pittsfield, Brockton,

		New Bedford, Taunton as well as additional low-income districts of Ware, North Adams, Greenfield, and Southbridge.
Hired graphic design firm for Harvest of the Month.	11/30/12	Completed – Completed interviews with organizations that have implemented Harvest of the Month campaigns to identify priorities for designers as well as available materials that can be adapted rather than created anew. Hired Sirius Designs and Ashley Chase, painter.
Organized specialty crop farmer trainings and educational materials.	12/31/12	Completed – Updated training guide for specialty crop farmers to format as a course guide for classroom trainings; conducted 1 training with New Entry Sustainable Farming Project that was held December 10th, 2012. One training conducted for Northeast Organic Farming Association-Massachusetts Summer conference in August 2013 and a third training held in conjunction with MA Department of Agricultural Resources' business training course: Tilling the Soil in November 2013.
Design of Harvest of the Month materials and outreach plans.	1/31/13	Completed - Hired designer and developed design for HOTM posters, trading cards and stickers. Developed criteria for participation in HOTM, wrote participation agreement and circulated to colleges, public and independent school food service directors. Plans to continue promoting HOTM through all newsletters, website and in person at conferences.
College and university outreach campaign	1/31/13	Completed– ongoing training and technical assistance provided to the target campuses. Engagement with administrators and dining directors at Bunker Hill Community College around local foods procurement language in contracts; outreach to Framingham State College about increasing specific local crop procurement through Harvest of the Month Campaign and strategies for sourcing local foods through a distributor; continued unsuccessful outreach to UMASS-Lowell dining directors (Aramark) and administrators

		confirming assumptions about Aramark's willingness to engage on this topic. Engaged UMass Amherst and Greenfield Community College in our Harvest of the Month campaign and increasing local procurement of MA specialty crops. Created web content targeting college and university audience with procurement resources; outreach via eblasts regarding state procurement laws and procurement assistance.
At least 1 geographically-related school food administrator workshop held.	2/28/13	Workshops moved to April
At least 1 farmer training held	3/31/13	Completed – Presented at the Urban Farming Conference in Boston on February 6, 2013. Discussed opportunities for urban growers to grow specifically for the school/institutional market.
Announce upcoming Harvest of the Month campaign to school food service directors, principals, educators, etc.	3/31/13	Completed – Posted all HOTM campaign information on the website on 3/9/13 and sent email to all public school districts in the state on 3/11/13.
Technical assistance for administrators who attended workshop provided	3/31/13	Workshops moved to April. See below.
Technical assistance for farmers who attended trainings provided	3/31/13	Completed – Technical assistance ongoing to Yard Birds Farm to connect to the Hampshire Regional Schools. Additional technical assistance too many Cape Cod farms that attended the April 29th school food administrators' workshop and continued outreach to farmers through the Cape Cod Buy Local network. Farms include Luscious Grown (successful match to Mashpee schools), Dave's

		Greens, and Hillside Poultry Farm.
Geographically-related school food administrator workshops held	4/30/13	Completed - Held two workshops in April 2013. The first was held at the Dennis-Yarmouth schools on Cape Cod and brought school administrators, educators, advocates and food service staff from throughout Cape Cod and Martha's Vineyard. Workshop was co-sponsored by Island Grown Schools and Sustainable Cape. The second workshop was held in Hampshire County and was co-sponsored by SPIFFY, a coalition of over 60 community partners working together to improve outcomes for youth in Hampshire County. A third school administrator presentation was scheduled for the upcoming Mass Association of School Business Officers annual conference held on Cape Cod during Spring 2014.
Technical assistance provided for administrators who attended workshop provided	4/30/13	Completed – Ongoing technical assistance provided to districts on Cape Cod including Truro, Nauset, Mashpee and Monomoy. Nauset and East Sandwich have signed up for Harvest of the Month. Ongoing assistance to Hampshire Regional schools and working to ensure good communication with large local grower who has supplied product in the past.
Offered Harvest of the Month information and materials online and send order forms for shipping through the mail to school food service directors	4/30/13	Completed: HOTM materials order forms distributed in April to all school districts and posted on our website. Materials shipped in July and August.
Technical assistance provided in preparation for	5/31/13	Completed: conducted outreach to schools that signed up for HOTM to ensure they have sources of local produce. Continued outreach

next school year.		to farmers and distributors to ensure sufficient supply of HOTM crops. Ongoing promotion of HOTM and developing of additional tools for successful promotion such as recipes. Two food service management companies committed all of their districts throughout the state to participate in HOTM (totaling 54 districts) and we worked with the distributor to ensure adequate supply from local farms.
Shipped HOTM materials for September use.	6/30/13	Completed – All districts that signed up prior to the end of the school year received HOTM materials – trading cards, stickers and posters in accordance with their individual orders.
Technical assistance for summer feeding sponsors.	6/30/13	Completed – Outreach to target districts through email, distribution of summer-specific technical assistance flyers at relevant events.
Statewide survey of school, college, and state agency food service directors about preferential purchasing of local specialty crops, including questions about HOTM campaign, completed.	6/30/13	Completed – Survey distributed through e-newsletter and direct email and then followed up with individual telephone calls. Response rate was somewhat lower than desired – we think this was due to confusion of our survey with a similar survey being conducted simultaneously by the USDA Farm to School Program. Surveying continued in person at the School Nutrition Association Summer Institute and throughout the summer months.
Statewide survey of specialty crop farmers about institutional sales completed	6/30/13	Completed with follow-up activity identified – Online survey distributed and followed up with phone calls. Surveying continued throughout the summer due to slightly lower response rates than previous years. We are trying to analyze the factors that may have contributed to a lower response rate and a few farms indicating they were no longer pursuing institutional sales through the application of a subsequent grant: Northeast Sustainable Agricultural Research and Education grant. With this SARE grant we are taking a closer look at farm income from

		and participation in institutional sales.
Shipment of HOTM materials for September use.	7/31/13	Completed – Materials distributed via mail and brought to school districts participated in school nutrition conferences.
Technical assistance for summer feeding sponsors.	7/31/13	Completed – Individualized outreach to summer food service sites. Specific communities include Salem, Beverly, Lowell, and Springfield.
Harvest of the Month information and materials disseminated to schools for September and October.	8/31/13	Completed - All previously registered and newly registered school districts received posters, trading cards and stickers. Targeted newsletter distributed with recipes featuring the September crop (tomatoes) and October crop (pears) and curricular resources. Resources also posted to the Harvest of the Month page of the MFTSP website.
State agency outreach campaign	10/31/13	Completed - In partnership with Harvard Law School's Food Law and Policy Clinic, conducted extensive research on current procurement practices by state agencies. Research indicated significant structural barriers to local procurement by state agencies. Participated in a Department of Public Health led Health Eating Community of Practice where we contributed to the development of a toolkit for local foods procurement by state agencies. Determined that making specific policy suggestions for the system as a whole was a more appropriate next step than technical assistance at the individual agency level.
At least 2 specialty crop farmer trainings held.	12/31/13	Completed- 4 trainings held – held one training on December 10th, 2012 in partnership with New Entry Sustainable Farming Project at their offices in Lowell, MA. A second training was held with the Boston Urban Agriculture conference in March 2013 and a third was held in August as part of the Northeast Organic Farming Association summer conference. A

		fourth training in partnership with MDAR's farm business planning course is in development in November 2013.
High-volume technical assistance as schools enter back into session and the harvest season reaches its peak.	12/30/13	Completed- Significant assistance provided to school districts throughout the state to identify sources of HOM crops, crops for special Harvest for Students Week celebrations, and for National Farm to School Month in October. Districts reached include – Springfield, Worcester, Westfield, Hampden County, Salem, Beverly, Brockton, Monomoy, Nauset, Brookline, Medford, West Bridgewater, and direct work with Whitsons and Chartwells food service management companies that represent over 30 districts in MA. Farm technical assistance includes many Cape Cod and Southeastern Mass farms including Oakdale Farm, Buckle Farm, and Dave's Greens and Western Mass farms including Cecchi, Equinox, Book & Plow and Czajkowski. Technical Assistance to specialty crop distributors including Maine's, Costa, Roch's Produce & Guaranteed Fresh.

b) If the outcomes measured are long term, summarize the progress that has been made toward their achievement.

Increased procurement of Mass. specialty crops by schools is a 'win-win' because it has the added benefit of increasing universal access to healthy foods for students while providing additional sales opportunities for specialty crops producers. Research shows that students will eat more fruits and vegetables when local products are served. Farm to school programs have improved students' knowledge, attitudes and behaviors towards healthy, local foods, and that early exposure to healthy foods in school positively impacts student eating habits. By introducing our Harvest of the Month campaign MA students in 117 school districts were exposed to and consumed locally produced healthy fruits and vegetables. The Harvest of the Month campaign included promotional materials and tools to encourage positive attitudes towards healthy foods. Our ongoing technical assistance to food service directors provided their staff with additional tools to prepare and serve locally produced healthy foods for students to create a positive experience for all involved. Our work on this project also aimed to further our work in increasing institutional marketing channels for specialty crop producers here in MA. Through our group technical assistance opportunities and our ongoing "one on one" technical assistance we have provided to specialty crop producers we have increased awareness of these sales opportunities and provided farmers with the information needed to pursue these expanding

markets. This project resulted in new, successful farmer relationships with institutional markets as a result of our Harvest of the Month campaign and realized a deepening of distributor relationships with specialty crop producers across the state.

c) A comparison of actual accomplishments with the goals established for the grant period **and** (d) Illustration of baseline data that has been gathered to date and the progress towards achieving set targets.

GOAL 1: Increase awareness and consumption of specialty crops by launching an institutional cafeteria "Harvest of the Month" promotional campaign, featuring 6 specific Mass. grown specialty crops (one each month).

The original target of at least 33% of school districts having awareness of HOTM and at least 25% participating was exceeded. 117 districts, or 36.2% of Massachusetts public schools, participated in the inaugural year of HOTM. Of participants who responded to our evaluation, over 90% actively promoted HOTM crops to students and staff through the use of HOTM posters. Over 90% served local tomatoes, pears, and apples. Local kale was served by 65% and local carrots and butternut served by 74%. 10.3% reported a definite increase on local specialty crop purchases over the previous school year.

See table of HOTM participants below, including the number of participating cafeterias and average students served.

Harvest of the Month Participants Sept. 2013 - Feb. 2014

City	Organization	# of cafeterias	Ave. # of lunches served per day
PUBLIC K-12 SCHOOL DISTRICTS: 116		713	202303
Acton	Acton Public Schools and Acton-Boxborough Regional School	7	3000
Amesbury	Amesbury Public Schools	4	1100
Amherst	Amherst Regional Public Schools	5	1300
Ashburnham	Ashburnham-Westminster Regional	5	451
Ashland	Ashland Public Schools	5	1125
Attleboro	Attleboro Schools	9	5000

Belchertown	Belchertown Schools	5	1400
Bellingham	Bellingham Public Schools	6	1600
Belmont	Belmont Day School	1	300
Beverly	Beverly Public Schools	7	800
Billerica	Billerica Public Schools	9	4500
Blackstone	Blackstone Millville Public Schools	5	1000
Bourne	Bourne Public school	4	900
Braintree	Braintree Public Schools	10	2500
Bridgewater	Bridgewater-Raynham Regional Schools	7	3000
Brockton	Brockton Public Schools	28	15000
Brookline	Public Schools of Brookline	9	2200
Burlington	Burlington Public Schools	6	1800
Byfield	Triton Regional School District	5	1300
Cambridge	Cambridge Public Schools	13	6000
Chesterfield	Hampshire Regional Schools	1	90
Chicopee	Chicopee Schools	15	6200
Clarksburg	Clarksburg Elementary School	1	125
Concord	Concord-Carlisle Regional School District	6	1500
Dartmouth	Dartmouth School Committee	6	1900
Dover	Dover Public Schools	1	250
East Bridgewater	East Bridgewater Public Schools	3	870
East Longmeadow	East Longmeadow Public Schools	5	1400
East Sandwich	East Sandwich Public	4	1051
Easthampton	Tri County School	1	95
Easthampton	Easthampton Public Schools	4	110

Edgartown	Edgartown School District	1	250
Erving	Erving Public Schools	1	90
Fall River	Fall River Public Schools	18	7000
Florida	Florida Schools	1	80
Franklin	Franklin Public Schools	10	2152
Gardner	Gardner Public Schools	5	1200
Georgetown	Georgetown Public Schools	2	627
Gloucester	Gloucester Public Schools	8	1600
Grafton	Grafton Public Schools	6	1097
Granby	Granby Public Schools	3	375
Great Barrington	Berkshire Hills Regional School District	3	825
Hadley	Hadley Public Schools	2	300
Harwich	Monomoy Public Schools	5	200
Haverhill	Haverhill Public Schools	10	4232
Hingham	Hingham Public Schools	6	189
Hopkinton	Hopkinton Public Schools	5	100
Hudson	Hudson Public Schools	8	1136
Hull	Hull Public Schools	3	600
Huntington	Gateway Regional School District	3	675
Hyannis	Barnstable Community Horace Mann Charter Public School	1	288
Jamaica Plain	Boston Public Schools	2	900
Jefferson	Wachusett Regional Public Schools	11	3000
Kingston	Kingston Public Schools	1	170
Lawrence	Lawrence Public Schools	19	10
Lexington	Lexington Public Schools	10	2636

Lexington	Minuteman Regional High School	1	300
Lincoln	Lincoln Public Schools	3	500
Longmeadow	Longmeadow Public Schools	9	1074
Manchester	Manchester Essex Regional Schools	4	600
Marblehead	Marblehead Community Charter Public School	1	130
Marblehead	Marblehead Public Schools	1	400
Marshfield	Marshfield Public Schools	7	2400
Maynard	Maynard Schools	3	720
Medford	Medford Public Schools	7	1800
Melrose	Melrose Public Schools	8	1250
Mendon	Mendon-Upton Regional School District	4	236
Middleton	Middleton Public Schools	2	250
Milton	Milton Public Schools	6	2300
Monson	Monson Public Schools	3	850
Nantucket	Nantucket Public Schools	3	750
Newburyport	Newburyport Public Schools	5	1500
Newton	Newton Public Schools	22	3799
North Adams	North Adams Public School District	4	890
North Dighton	Dighton-Rehoboth Public School District	5	1200
Norwell	Norwell Public Schools	4	250
Norwood	Norwood Public Schools	9	2000
Orange	Ralph C Mahar Regional School	1	650
Orleans	Nauset Public Schools	7	1130
Otis	Farmington River Regional School District	1	100

Peabody	Peabody Public Schools	10	2089
Pittsfield	Pittsfield Public Schools	12	4000
Plainville	Plainville Public Schools	2	550
Randolph	Randolph Public Schools	6	2200
Rockland	Rockland Public Schools	5	1300
Salem	Salem Public Schools	11	2450
Scituate	Scituate Public Schools	6	1800
Seekonk	Seekonk Schools	4	1000
Shrewsbury	Shrewsbury Public Schools	8	3800
Somerset	Somerset Regional	1	386
Somerville	Somerville Public Schools	10	1500
South Hamilton	Hamilton-Wenham Regional School District	5	765
Springfield	Springfield Public Schools	10	22000
Sunderland	Frontier Regional School District	3	500
Sutton	Sutton Public Schools	3	450
Swampscott	Swampscott Public Schools	6	750
Swansea	Swansea Public Schools	6	1100
Taunton	Bristol-Plymouth Regional Voc Tech	1	457
Tewksbury	Tewksbury Public Schools	7	1800
Topsfield	Tritown School District	2	400
Topsfield	Masconomet Regional School District	1	900
Topsfield	Topsfield Public Schools	2	325
Townsend	North Middlesex Regional School District	6	1285
Tyngsboro	Tyngsboro Public Schools	3	745

Vineyard Haven	Martha's Vineyard Public Schools	1	400
Wakefield	Wakefield Public Schools	7	500
Walpole	Walpole Public Schools	7	1500
Warren	Quaboag Regional School District	3	950
Watertown	Watertown High School	5	850
Wellesley	Wellesley Public Schools	10	1248
West Bridgewater	West Bridgewater School District	4	500
West Newbury	Pentucket Schools	6	1450
Westborough	Westborough Public Schools	6	980
Weston	Weston Public Schools	5	109
Westwood	Westwood Public Schools	5	700
Winchester	Winchester School District	2	1465
Worcester	Worcester Public Schools	59	15821
Wrentham	Wrentham/Plainville Public Schools	2	600
INDEPENDENT & PRE- SCHOOLS: 11		16	4050
Prides Crossing	Landmark School	2	800
Springfield	Square One	4	450
Gill	Northfield Mount Hermon	1	600
Kingston	Sacred Heart High School	1	170
Lancaster	Dr. Franklin Perkins School	1	125
Boston	The Home for little wonderers	2	5
Groton	The Groton School	1	600
Manchester	Brookwood School	1	400
Deerfield	Deerfield Academy	1	900
Weston	Cambridge School of Weston	1	

Worcester	Nativity School of Worcester	1	
COLLEGES & UNIVERSITIES: 9		30	16750
Worcester	Assumption College	1	800
Worcester	Clark University	1	2600
Great Barrington	Bard College at Simon's Rock	1	250
Greenfield	Greenfield Community College	1	200
Framingham	Framingham State University	2	2000
Amherst	UMass Auxiliary Services	4	5000
Boston	Boston University	3	5000
Dartmouth	UMass Dartmouth	16	200
Dudley	Nichols College	1	700
OTHER: 2			
Topsfield	Northeast Harvest		
Lexington	Kids Cooking Green		
Seekonk	South coast Educational Collaborative		
		Total HOTM meals	223103

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GOAL 2: Offer at least 3 geographically-based trainings for specialty crop producers to share information and case studies about increasing their involvement with, and profits from, the institutional demand for locally grown foods.

The original target was an increase of 17 new farms reporting direct sales to institutions. While we actually held four workshops for growers, not three, our research indicates that the number of new farms reporting direct sales to institutions did not increase significantly. We have decided to dig deeper into this issue to try to understand why some farms are indicating that they may not sell direct to institutions. Preliminary research suggests that increased sales through distributors and concern about the legal implications of aggregating product from neighboring farms to fill

orders for direct sales may be contributing factors. We are currently undertaking an in-depth survey of specialty crop producers with support from a SARE grant to better understand this shifting sales landscape and opportunities to best support growers in profitable sales to institutions.

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GOAL 3: Offer at least one training at a School Nutrition Association statewide conference focused on continued education about farm to school procurement, the benefits of contract growing, and how to fit local purchasing into the new school food nutrition guidelines.

Our target was an increase in knowledge of farm to school opportunities and an increase of 10% (or 27 more schools) reporting local purchases over the SY2010-2011 number which was 271 public school districts.

The workshop offered at the summer institute of the School Nutrition Association was well received and resulted in additional sign-ups for Harvest of the Month. However, we had difficulty with response rate to the survey of school districts, which we use to calculate the number purchasing local foods. Research indicated that the low response rate may have been due to confusion about a survey being administered simultaneously by the USDA Farm to School Program, the Farm to School Census. We accessed USDA's survey results to try to create a more complete picture of the state of local procurement. However, only 247 districts responded to the USDA's survey, lower than our response rate in 2010-2011, making it impossible to measure an increase in reporting of local procurement.

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GOAL 4: Increase Mass. specialty crop awareness and procurement by colleges and universities and state agencies through targeted outreach and, in the case of public institutions, through promotion of the state's preferential purchasing legislation.

In partnership with the Harvard Food Law and Policy Clinic, we completed research on state agency and college local procurement and conducted outreach about the legislation. What the research indicated was structural barriers to local foods procurement by state agencies. Before we can reach the target of a 20% increase in local foods procurement, we must first address some of these barriers that exist due to the structure of state contracts and food service management company contracts at state colleges and universities. With the publication of a policy brief for advocates, legislators, and state agency representatives, we have begun the process of raising awareness of these barriers and proposing solutions.

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GOAL 5: Present at least 3 workshops for school administrators, business managers, and other school food stakeholders in geographically-related areas to promote and educate about farm to school procurement and legislation, benefits of contract growing agreements, and how to fit local purchasing into the new school food nutrition guidelines.

Our target for this goal was an increase in the understanding of farm to school by school food stakeholders in each of the geographic areas. This can be demonstrated by significant increase in

requests for technical assistance on local foods procurement by food service directors in the areas where the workshops were held and by the feedback from food service directors expressing increased support from administration for farm to school activities. In place of third geographic workshop, we presented a workshop at the Massachusetts Association of School Business Officers' annual conference in order to best reach this group.

e) Summarize the major successful outcomes of the project in quantifiable terms.

This project was successful at raising awareness of farm to school across the state and engaging new institutions in local specialty crops procurement. In addition, we successfully engage a broad audience of specialty crop producers, increasing knowledge of how to access the institutional market.

- We successfully launched a local specialty crop promotion campaign, Harvest of the Month, with participation of 136 K-12 public schools, independent schools and colleges. Of participants who responded to our evaluation of the Harvest of the Month program, more than 10% reported an increase in the volume of locally grown specialty crops purchased over the prior year and over 90% actively used the promotional materials to educate students. The success of our SY13-14 program led to the expansion of HOTM to a 12 month program for SY14-15.
- The outreach campaign and research about local procurement with state agencies and public colleges led to clear information about the limitations of existing local procurement legislation and clear recommendations for both education and advocacy efforts to overcome these limitations.
- Conducted outreach and provided technical assistance to 6 targeted public colleges and universities, two of which signed up to participate in Harvest of the Month.
- The three successful farmer workshops held throughout the state adequately increased farmer knowledge of institutional sales and the growing opportunities of institutional markets across the region. The updated farmer training materials used to conduct these group trainings were provided from all attendees as an ongoing reference and resulted in increased follow up, technical assistance requests from area specialty crops producers.
- Successfully technical assistance to Whitsons Culinary Group and Chartwells leading to 17 Whitsons managed-districts and 36 Chartwells districts participating in Harvest of the Month.
- Successful discussions with specialty crop distributors including Costa and Sid Wainer to ensure adequate supply of Mass.-grown HOTM crops and additional specialty crops for sale to institutional customers.

4) Beneficiaries (including the following information)

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

Project beneficiaries include several institutional and school food service individuals and organizations as well as specialty crop producers, producer associations, and farm service organizations including:

- School Nutrition Association of Massachusetts
- New Entry Sustainable Farming Project
- Northeast Organic Farming Association-Massachusetts
- Massachusetts Association of School Business Organizations
- Massachusetts Department of Agricultural Resources
- Massachusetts Department of Elementary and Secondary Education - Office of Nutrition, Safety, and Health
- Sustainable Cape Cod
- Massachusetts Fruit Growers Association
- Whitsons Culinary Group
- Chartwells K-12 Division

b) State the number of beneficiaries affected by the project's accomplishments and / or potential economic impact of the project.

117 school districts in Massachusetts were direct beneficiaries through their participation in the HOTM program. Over 10% of participants in HOTM reported purchasing more locally grown specialty crops in school year 2013-2014 than in previous years, representing clear financial benefit to Mass. specialty crop producers.

Increased awareness of institutional sales opportunities for over 40 specialty crop producers through multiple venues including NOFA-Mass, MDAR, and New Entry Sustainable Farming Project workshops and individual technical assistance.

Increased awareness amongst 8 specialty crop distributors of local producers and corresponding institutional demand for local product.

5) Illustration of the lessons learned as a result of completing this project.

This project provided several clear lessons about the barriers and opportunities for increasing procurement of locally grown specialty crops by Massachusetts institutions:

1. Institutional Food Service Directors respond well to a clear framework for local foods procurement such as Harvest of the Month. This provided an easy entry point for those new to local foods procurement and a way to expand and increase promotional efforts for those already purchasing local foods. The campaign produced an increased in local specialty crop procurement.
2. A campaign such as Harvest of the Month helps communicate in advance to specialty crop growers what products will be of interest to school customers. This facilitates discussions about contract growing or other forms of pre-season crop planning that can lower risks for growers and increase profitability.
3. Significant barriers exist to local specialty crop procurement by state colleges and universities. Before major increases in local procurement can be achieved, structural barriers such as the formulation of the state contracts and bidding process must be addressed. Clear opportunities exist for both education of buyers and advocacy for legislators and state agency administrators.

4. Many farmers are not interested in delivering directly to schools but access this market through sales to distributors who serve schools. Better survey tools are needed to more accurately account for the scale of local specialty crops entering the institutional market.
5. Bringing together school food stakeholders beyond food service directors can build support for local specialty crop procurement. In particular, administrators such as business managers and principals and community partners can help create demand for local procurement.

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Project Title: Overcoming Barriers to Specialty Crop

Organization: Sustainable Business Network (SBN)

FY 2012 12-25-B-1467

Final Report:

Project Summary

Within the buy local movement in Massachusetts and across the nation, there exist a number of significant barriers to full integration of specialty crop items into the supply chain of food vendors—food and beverage vendors, specialty food manufacturers, and institutions. Barriers vary for buyers and sellers of specialty crops, but range from issues related to economies of scale to tight financial margins to the seasonality of products in New England. These barriers are inhibiting the expansion and integration of specialty crop sales across Massachusetts. It is felt that by fostering dialogue between these two parties, growers/producers and vendors/buyers, many of these barriers could be addressed and potentially overcome, while also building new relationships and tools for the local food movement.

By hosting a Specialty Crop Buy Local Trade Show, specialty crop growers and buyers are given the space and opportunity to address these barriers including seasonality, quantity, and cost, while establishing new business partnerships and increasing the sales of specialty crops across Massachusetts. By understanding the needs of the buyers in greater detail, specialty crop producers would be better prepared for crop planning with the potential for guaranteed or increased sales.

This Trade Show is building upon the success of the 2010 Buy Local Trade Show and will continue to leverage the relationships and resources developed to date, while continuing to engage with our 'buy local' partners to further integrate with additional specialty crop growers and buyers.

Project Approach

The purpose of this project was to host a Buy Local Trade Show to address and overcome barriers to specialty crop grower and buyer collaboration including seasonality, quantity, and cost; to establish new business partnerships between local specialty crop growers and buyers and to increase the sales of specialty crop products in Massachusetts. Beyond the one-day event, it was also our goal to serve as ongoing support for producers and purchasers throughout the remainder of the grant year to foster and solidify grower-purchaser relationships, increase purchasing and more. Since our event was open to both specialty crop producers, and non-specialty crop producers, we reserved spaces for specialty crop producers, and created a waiting list for non-specialty crop producers. In this way, we limited the number of non-specialty crop producers at the event and gave priority to specialty crop producers.

Summary of Activities

The Sustainable Business Network of Massachusetts worked closely with project partners including 'Buy Local' groups from around the state, including the Massachusetts Department of Agricultural Resources (MDAR), Southeastern Massachusetts Agricultural Partnership (SEMAP), Island Grown, Berkshire Grown, Community Involved in Sustaining Agriculture (CISA), Northeast Harvest, Berkshire Grown and Buy Fresh Buy Local on Cape Cod as well as the Northwest Atlantic Marine Alliance (NAMA) and Health Care Without Harm, to engage specialty crop growers and buyers, while also developing a seminar series that would most benefit these parties. The Trade Show seminars were developed for both buyers and sellers to maximize the relevant information, recommendations and resources for each party. The seminars consisted of a panel of leaders with experience selling or purchasing specialty crops and allowed for question and answer between panelists and participants. The seller seminar topic included best practice strategies for trading wholesale with restaurants, distributors, retailers and institutions while the buyer seminar topic focused on best practices for restaurants, distributors, retailers, and institutions with the goal of finding innovative and creative ways to work with farmers and local food producers. Growers/producers and vendors/buyers were recruited from across the state to participate in this event, with a focus on specialty crop promotion and sales.

Massachusetts specialty crop producers were recruited for and engaged beyond this event in a number of ways, including

- Direct e-mail invitation through event lists including our previous Buy Local Trade Show and Seminar in 2010 as well as our farm outreach list used for the Boston Local Food Festival and ALLocal Dinner series.
- Direct e-mail invitations and newsletter blasts through Buy Local networks, totaling more than a few thousand e-mail contacts reached.

- Tabling at the Winter NOFA Conference in Worcester, MA and directly connecting with over 40 exhibitors with ties to Massachusetts Specialty Crops and over 1,000 conference attendees.
- Website promotion of all of the Trade Show buyers and sellers – they were listed on our website to encourage additional business connections beyond the event itself and are hosted throughout the year.
- Listings in our Wholesale Buying Guide - Specialty Crop producers with an interest in selling wholesale are added to the Boston Local Food Wholesale Buying Guide, which we host on our website and distribute directly via e-mail to interested vendors for our festival and other events to encourage the use of Massachusetts-based specialty crops.

Our goal was to engage between 40 and 50 specialty crop farmers and food producers and more than 100 retail and institutional buyers. Our actual attendance and engagement included 53 buyers and 27 specialty crop growers/producers, yet the number of growers and buyers we have connected with in 2013 is far greater. The buyer/seller list was compiled and shared with all participants including those that were unable to attend the Trade Show due to a late season snowstorm, and we followed up with all participants via phone or e-mail to assess effectiveness of resources provided as a result of this Trade Show. A summary of our outcomes can be found below within Outcomes Achieved.

Because this Trade Show was not limited to solely specialty crop producers, we ensured that grant funds were not utilized to benefit these other commodities including dairy, meat and other non-specialty crops by instituting a $100 participation fee for non-specialty crop exhibitors and $25 per person for all buyers, which covered our program costs of coordinating these vendors and participants.

Following the Trade Show, SBN compiled post-event survey results and shared with event partners, e-mailed an updated buyer/seller list to partners and all event participants, and added specialty crop producers to the 2013 Wholesale Buying Guide, a resource that is shared with vendors for all SBN events. Results are outlined below within Outcomes Achieved.

Goals and Outcomes Achieved

Through the 2013 Buy Local Trade Show and Seminar, we have been able to offer resources to hundreds of specialty crop producers across the state. Additionally, we hosted 27 specialty crop producers at the Trade Show along with over 50 potential buyers, engaging many more via our website and distribution of our 2013 Wholesale Buying Guide throughout the year. As a result of this Trade Show, we have seen an increased demand for future Trade Show events and resources that allow for more direct contact between potential buyers and sellers of specialty crop products, such as buyer seller lists and tools to help overcome barriers to buying or selling these products.

We learned through our post-event survey that specialty crop producers interacted with an average of 10.6 potential buyers at the Trade Show, a majority of them being restaurants, with 2.6 new business connections being made on average. Of the 27 specialty crop producers that directly participated or registered for the Trade Show, 33% indicated that they had made at least 1 new business partnership. Of the 53 buyers, 13% developed new business connections.

We followed up again with specialty crop growers and buyers 6 months after the Trade Show via e-mail and phone and found that of the 14 growers/producers that responded, 4 had made between 1 and 5 additional new business relationships. Of the 6 buyers that responded, 2 had made between 1 and 5 new business relationships.

None of our Trade Show survey respondents provided us with information about % increase in sales due to the event as we had anticipated, and many producers were unable to attribute % increase in sales, if they experienced them, to their participation in the Trade Show, although it was made clear to our staff and partner organizations that we should be tracking other benefits to the specialty crop businesses such as skill sets acquired, networks developed, as well as longer-term data tracking related to business relationships fostered at this event and in the post event follow up as many of the new business relationships require modification in business planning in order to make the relationship successful.

Despite not reaching our anticipated outcome of business relationships made, which was 50% of both buyers and specialty crop sellers making at least one new business connection, 100% of both the specialty crop buyers and sellers indicated that the event was beneficial to their business. 91% of specialty crop growers said that they would attend this event again, as well as 92% of the buyers.

Beneficiaries

The beneficiaries of this event include Massachusetts based specialty crop growers and producers, potential specialty crop wholesale and retail buyers, and statewide 'buy local' groups. Our hope is that consumers also benefit from this event as visitors to our website and participants in other SBN events with an interest in how our local food system is functioning and growing.

Specialty crop growers and producers are gaining increased exposure for their products and services, which may lead to increased sales across the state. They also benefit by developing a broader network of specialty crop growers to learn from, as well as a group of potential buyers that they have more personal connections with, making it easier to develop long term business relationships. Buyers benefit from participation in our event by gaining a better understanding of specialty crops available within the state along with strategies for purchasing specialty crops retail or wholesale. They also benefit from a broader network between other buyers, creating a more coherent learning action network to create efficiencies for purchasing more specialty crops. This event also helps them to meet the growing demand for specialty crops in the marketplace.

Our 'buy local' partners benefit by increasing exposure to markets for their members or networks of specialty crop producers, and by supporting events like this, they are strengthening the brand of 'buying local' for consumers of all levels, from individual consumers, to larger institutional marketplaces. They also gain exposure via our event outreach, website, promotional materials, a vendor space at the event to network, as well as access to data generated by the event related to specialty crop sales and best practices.

Lessons Learned

By hosting the Buy Local Trade Show for a second time, we have been able to reinforce our understanding for the importance of this event to specialty crop growers, producers and buyers. We found that there is a strong interest in the networking portion of the event, both to allow

sellers to connect to other sellers, as well as sellers to connect with potential buyers. The topical workshops were very popular and were attended by most registered participants. We attracted specialty crop growers and producers that were both well prepared to develop wholesale business relationships, as well as some growers that were learning more about how to build capacity to get to that level within their business. This was a major factor in how many specialty crop growers in attendance were actually able to make new business relationships within 6 months of the event.

Specialty crop growers have a strong interest in being listed in our wholesale buying guide in order to continue the exposure to their business for wholesale and retail buyers, and SBN has had hundreds of restaurant and prepared food vendors access this list since March of 2013, with new producers being listed in the guide yearly. This guide, as well as our outreach through our event partners, our e-mail and phone follow up with growers and buyers, and our website that remains active throughout the year, offer effective methods for supporting event participants before and after the Trade Show, thus increasing the overall positive gain toward increased specialty crop sales and decreased barriers in the state of Massachusetts.

One of our greatest challenges has been collecting quantitative data to illustrate the growth in specialty crop sales. It was difficult to get responses both by phone and e-mail to gather this data 6 months out from the Trade Show. Moving forward, we will now be able to institute a more comprehensive survey to return specialty crop producers for the 2014 Buy Local Trade Show in addition to working closely with Community Involved in Sustaining Agriculture (CISA) to gain data from their annual surveys to develop indicators for growth in specialty crop sales that are more easily quantifiable.

SBN has received commitment from the buy local groups as well as our other event partners to continue strengthening this event towards the goal of overcoming barriers to specialty crop integration in the marketplace. SBN is committed to assisting in the business development and relationship building between specialty crop growers and producers with potential buyers to further produce capacity for increased specialty crop sales across Massachusetts.

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Organization: NOFA/Massachusetts

Project Title: Improving educational resources for Massachusetts Vegetable Growers

FY 2012 12-25-B-1467

Final Report

Project Summary

As the market for fresh, healthy foods grows, farmers have to learn how to contend with increased competition and new ways of distributing their products. This project sought to provide them with tools for meeting those challenges, by offering access to educational information that would help vegetable, fruit and herb farmers take their operations to the next level and expand into untapped markets.

Project Approach

This project provided funds for NOFA/Mass to hire writers to attend 15 key workshops at each of our two annual conferences and write detailed summaries of the sessions for publication in the NOFA/Mass newsletter and on our website. The writers focused on capturing practical information offered by the presenters, in an effort to have the online library be as useful as possible to fruit and vegetable farmers. Our Public Relations Coordinator edited each of the pieces, our Webmaster posted them online, and the Public Relations Coordinator included some of the articles in our monthly newsletter, publicized them through social media, and informed many of our allied agricultural organizations about the availability of this resource.

The articles are being published one at a time in our monthly newsletter and are available online. We have sent announcements about the availability of this online resource to many agricultural organizations throughout Massachusetts, and they have passed that announcement along to their members via their newsletters and social media.

The articles now available on our website are:

- Accessing Wholesale Supply Chains: Best Practices for Small-Scale Farmers in New England

- Beyond Nitrates: Understanding Anions in Soil Fertility in the Northeast
- Building a Foundation for Markets through Value Chains
- Cider Making
- Conducting a Food System Assessment in Your Town
- Crop Planning For Intensive Market Gardens
- CSA—Is It For You?
- A Food Systems Approach to Hunger: Making the Connection for Communities and Foundations
- Growing Excellent Tomatoes
- Growing Organic Cucurbits: Cucumbers to Zucchini
- Growing Salad Greens: An Easy and Lucrative Cash Crop
- Growing Shiitake Mushrooms In The Woods
- Growing the Co-operative Food System
- Include Herbs in Your Diversified Crop Plan
- Logistics of Starting a CSA
- Marketing Strategies for Vegetable Growers
- Mobile Farmers' Markets and Working Towards a Food Hub in Worcester
- Organic Potato Production on Tobacco Road Farm
- Planning for CSA Success
- Saving Quality Vegetable Seeds
- Selling to Institutions: Is it Right for My Farm?
- Small-Scale Beet Production: Finances, Craft, and Science
- Small-Scale Intensive Farming: Lowering Risks and Increasing Profits
- Sugar and Fodder Beets for Stock and Sucrose
- Understanding Labor Laws for Beginning and Mentor Farm
- Wholesale Logistics Presented
- Worcester Polytechnic Institute’s Center for Sustainable Food Systems

The organizations we communicated with for help in publicizing the availability of this resource included:

- Berkshire Grown
- Buy Fresh Buy Local Cape Cod
- Community Involved in Sustaining Agriculture (CISA)
- Future Farmers of America (FFA)
- Mass. 4H Foundation
- Mass. Ag Commissions

- Mass. Agriculture in the Classroom
- Mass. Association of Roadside Stands & PYO
- Mass. Federation of Farmers Markets
- New England Small Farm Institute
- New England Vegetable & Berry Growers Association (NEVBGA)
- New Entry Sustainable Farming Project

Workshop title	**Number of page views per 11/20/13**	**Number of page views 11/20/13 12/15/13**	**Date posted**
A Food Systems Approach to Hunger: Making the Connection for Communities and Foundations	53	0	3/15/2013
Accessing Wholesale Supply Chains: Best Practices for Small-Scale Farmers in New England	96	5	3/15/2013
Beyond Nitrates: Understanding Anions in Soil Fertility in the Northeast	147	11	3/15/2013
Building a Foundation for Markets through Value Chains	19	0	3/15/2013
Cider Making	204	8	3/15/2013
Conducting a Food System Assessment in Your Town	154	5	3/15/2013
Crop Planning For Intensive Market Gardens	273	41	3/15/2013
CSA—Is It For You?	5	0	10/15/2013
Growing Excellent Tomatoes	17	12	10/15/2013
Growing Organic Cucurbits: Cucumbers to Zucchini	11	8	10/15/2013
Growing Salad Greens: An Easy and Lucrative Cash Crop	297	60	3/15/2013
Growing Shiitake Mushrooms In The Woods	16	33	10/15/2013
Growing the Co-operative Food System	33	0	3/15/2013
Include Herbs in Your Diversified Crop Plan	4	7	10/15/2013
Logistics of Starting a CSA	3	9	10/15/2013
Marketing Strategies for Vegetable Growers	8	6	10/15/2013
Mobile Farmers' Markets and Working Towards a Food Hub in Worcester	77	5	3/15/2013

Organic Potato Production on Tobacco Road Farm	6	0	10/15/2013
Planning for CSA Success	5	0	10/15/2013
Saving Quality Vegetable Seeds	309	3	3/15/2013
Selling to Institutions: Is it Right for My Farm?	3	3	10/15/2013
Small-Scale Beet Production: Finances, Craft, and Science	7	9	10/15/2013
Small-Scale Intensive Farming: Lowering Risks and Increasing Profits	657	91	3/15/2013
Sugar and Fodder Beets for Stock and Sucrose	14	26	10/15/2013
Understanding Labor Laws for Beginning and Mentor Farm	63	9	3/15/2013
Wholesale Logistics Presented	7	2	10/15/2013
Worcester Polytechnic Institute's Center for Sustainable Food Systems	47	5	3/15/2013

- Pioneer Valley Growers Association
- Southeastern Massachusetts Agricultural Partnership - SEMAP
- University of Massachusetts Extension
- Boston Gardeners Council/BNAN
- Community Gardens Greenhouse, Lowell
- Farm School
- Noonday Farm
- Lowell Urban Growers Network (in process of forming)
- Mill City Grows (Lowell)
- Nuestras Raices, Holyoke MA
- Regional Environmental Council
- Revision House Urban Farm
- theMOVE
- Wild Oats
- Arise Coop
- Harvest Coop
- Assabett Coop
- Dorchester Community Coop
- River Valley Market
- Berkshire Grown
- New Entry Sustainable Farming Project

Goals and Outcomes Achieved

The monthly NOFA/Mass e-newsletter is distributed to nearly 5,000 farmers, consumers, advocates and educators each month. The newsletter is distributed in a number of formats – the most widely read is a downloadable .pdf, so it is impossible to determine how many of our readers who viewed each newsletter read a particular article. The pieces written for this project, however, are also on our website as individual pages, and the following chart indicates how many page views each article has received:

It is important to note that the articles generated by the winter conference have been online for nearly eight months, while those from the summer conference were posted only a few weeks ago, so the discrepancy in the number of readers between those two sets is understandable.

In our proposal we indicated that we had hoped to generate 25 page views for each article written, and we have far exceeded that goal – the 14 pieces published in March have been read an average of 174 times each. Those posted in October have had fewer visits, only because they have been online for only a short time. As we continue to publicize the availability of these pieces, we anticipate steadily increasing readership.

The project experienced only minor challenges, mainly in that it took more staff time than expected to compile, edit and post each of the articles. The pieces are all online now, however, and are garnering the attention we expected.

Beneficiaries

As of 11/15/13 we know that at least 2,500 people have read the articles online, far more than we had anticipated. We know that the users of our site range from backyard gardeners to market farmers, and through communication with our members and others we have learned that many have found the articles to be a valuable resource for improving the economic viability of their farms through the adoption of management practices explained in the articles. Having this resource available for the foreseeable future will allow many more farmers to benefit from it, and we hope to secure funding that will allow us to build upon this success by developing articles on more topics.

Expenditures

Writers	$2,250.00	30 @ $75
Project Coordinator	$700.00	50 hrs @ $14/hr

Editor	$455.00	35 hrs @ $13/hr
Webmaster	$150.00	10 hrs @ $15/hr
Education Director	$1,140.00	60 hrs @ $19/hr
FICA for all salaries	$195.00	@ 8%
Total	**$4,890.00**	

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Organization: Massachusetts Farm Wineries & Growers Association

Project Title: Growing the Massachusetts Wine Industry Through the Use of Mobile Applications

FY 2012 12-25-B-1467

Final Report:

6. Growing the Massachusetts Wine Industry Through the Use of Mobile Applications

PROJECT SUMMARY:

Growing the Massachusetts wine industry through consumer awareness, market opportunities and continuing education.

Massachusetts Wine Trail Mobil Application - The purpose of this project was to Development of an interactive mobile application for iPhone, Android and Blackberry smart phones to showcase Massachusetts wine and reach new customers. Additionally, this project would develop promotional materials containing a QR code and application

download instructions with 20,000 pieces to be printed and distributed by Massachusetts wineries to inform potential end users about the application, its features, benefits and how to access it.

This is a new initiative and is not built upon any previously funded projects.

PROJECT PURPOSE:

Article II of the Mission of the Massachusetts Farm Wineries and Growers Association (MFWGA) states:

"The object of this Association shall be to foster, promote, and encourage the making, growing, selling and appreciation of Massachusetts wine and hard cider; to disseminate technical information for its members; to promote a more enlarged and friendly intercourse among those associated with all facets of the wine industry; and to enhance and promote the quality of Massachusetts wine."

The funds from this grant were utilized to help the Association fulfill several aspects of its mission related to selling and promotion of Massachusetts wine. Historically consumers have been unaware or under-aware of the vast amount and high quality of Massachusetts wine available to them. This project was designed to increase consumer awareness and facilitate growth of the industry by making it easy for consumers to locate wineries and move readily between wineries that are located nearby. This was a new initiative. There were no existing projects that incorporated current technology for the purpose of increasing consumer awareness of Massachusetts wine.

GOALS AND OUTCOMES:

Contractors were put in place to execute the components of design, implementation and hosting of the Mobil App and accompanying promotional materials as outlined in the original Work Plan. 80% of Association Member Wineries provided the necessary information to program the Mobile App to include their Farm Winery Location. In September 2014, following a review of the existing components and app design it was determined that updates were needed as a result of new generations of Smart Phones being released since the app was originally designed. Due to difficulties in communication MFWGA opted to work with a local firm on the updates and design elements. After extensive conversations, a local firm, Medium Studio, was selected to update the app. MFWGA communicated the change to the original design/hosting company (Bar Z) who had been selected by the previous Executive Director. The design elements and updates were completed in January of 2015. The Mobile App was scheduled to be launched in February of 2015.

During this period the project was reinitiated under the supervision of a new Executive Director. Due to the delays resulting from MFWGA staff changes and a lag since work had been done on the project, the design elements needed updating in order to produce a

Mobil App that is relevant to existing technology (newer generations of smart phones). MFWGA secured the necessary contractual support to execute the updates and complete the remaining steps of the Work Plan to ensure that the Mobil App will be delivered fully functional and within the established budget on or before February 1st, 2015. When the original contractor 'Bar Z' was contacted in late January 2015 to begin the final elements of preparing the app to be released MFWGA was informed that the hosting contract had run out and that the app could not be released without another substantial financial investment to cover another year of hosting.

Project partners from twenty six member wineries and vineyards of MFWGA have contributed significantly to the project. Partners have provided input and feedback on the selection of the project design components as well as the promotional strategies in preparation for the roll out of the App.

PROJECT APPROACH:

The MFWGA Board of Directors formed a working committee composed of MFWGA members and the previous MFWGA Executive Director. The committee promptly drafted requests for proposals and identified qualified third-party consultants to conduct the project. The committee then invited bids from the identified consultants and selected a third-party consultant which they believed had the qualifications to produce the deliverables cited above.

The previous MFWGA Executive Director was responsible for briefing the Contractor, and conducting periodic meetings not less than one a month with the Contractor to monitor the progress of the project and provide input and direction and report, on a monthly basis, to the MFWGA Board of Directors about the progress of the project. During this phase of the project it was mutually agreed upon by the Board of Directors and the previous Executive Director that the Association would begin a search for a new Executive Director. It appears that communication became less frequent during this extended period and very little activity occurred on the project. When the current

Executive Director was brought on board there was very little information regarding the progress of the project available. Bar Z, the Contractor who had been selected to work on the project provided an in depth briefing regarding the functionality of the app and the steps required to move forward. The new Executive Director gathered information from wineries to be included in the app. She also began the work of updating the components and functional design elements with a local team of designers as the existing components had fallen behind rapidly advancing technology. During the initial consult with the original contractor the Executive Director was assured that the "clock would not start ticking" on the hosting portion that had been paid for until the app went live. When all components were updated and information was in place for the final assembly of the app the initial contractor stated that only a test version of the app could be produced as the

hosting agreement had expired. Despite many lengthy conversations it was clear that without further financial investment, Bar Z would not launch and host the application nor would they release the necessary source codes to allow MFWGA to seek a more affordable hosting option. MFWGA retains the design elements produced by the local Contractor, Medium Studio, as well as the individual wineries data and hopes to secure an affordable way to create a functioning app in the future. Quality work was put into bringing the project to fruition though ultimately the refusal of Bar Z to allow the project to move forward by supplying the necessary source codes to move the app as designed elsewhere as they stated they would has paralyzed the project until funds can be raised to resurrect it.

BENEFICIARIES:

Though the elements were all completed the app was not officially launched. Without the ability to host the app MFWGA is left with a shell of an app that will need to be filled in and hosted by another, more affordable contractor before beneficiaries can reap the rewards of increased exposure for MA wineries and easier access to information about wineries by consumers and the general public. Baseline data does not exist for a mobile wine app in Massachusetts. Data was to be collected once the app was released to the public. Due to Bar Z's interpretation of the contract guidelines we were unable to launch the app and are currently working to raise funds to launch the app with a local company who specializes in mobile applications and digital media platforms. Massachusetts Wine Trail Mobil Application

LESSONS LEARNED:

The inability to bring the app to fruition was a direct result of the lack of communication between the outgoing and incoming Executive Directors. The incoming Executive Director was not involved in the negotiation of the initial contract to execute the mobile append due to the rapid advancement of technology some components needed to be rebuilt. The extended delays resulted in some frustration on the part of the initial contractor who ultimately ended the project sighting the contract deadlines as referring to a 'ticking clock' in regards to their hosting obligation. Despite many lengthy conversations it was clear that without further financial investment, Bar Z would not launch and host the application nor would they release the necessary source codes to allow MFWGA to seek a more affordable hosting option.

While it is understandable that the delays resulting from the staffing changes at MFWGA clearly affected Bar Z it is unfortunate that they refused to stand by their initial statement that the hosting portion of the contract would begin once the app was launched.

MFWGA continues to work diligently to expand access to and awareness of Massachusetts Wine. We are working to raise the level of awareness of this dynamic locally made product and to increase the financial impact of these crops on our communities across the Commonwealth. On behalf of the Massachusetts Farm Wineries and Growers Association, thank you for your support of our valuable work.

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Organization: Massachusetts Agriculture in the Classroom

Project Title: Strengthening the Connections between Agriculture and the School Garden,

Phase II

FY 2012 12-25-B-1467

Final Report:

2. Project Summary

The Project "Strengthening the Connections between Agriculture and the School Garden, Phase II" expanded on work carried out in three of the Garden-Based Education Initiatives funded by the 2012 Specialty Crops Grant. Its purpose was to help educators overcome some of the hurdles that stop them from starting a school garden and to help sustain their garden education programs into the future.

Massachusetts Agriculture in the Classroom's Garden-Based Education efforts came about as a direct result of the growing interest in school gardening in Massachusetts. As teachers and school administrators came to realize that garden-based education offered real benefits academically, developmentally and in terms of health and nutrition, they looked to incorporate more garden-based education opportunities into their curricula. Recent research supported the benefits of garden-based learning and drove their requests for more-and-more information and assistance related to developing school garden programs.

Massachusetts Agriculture in the Classroom (MAC) has a long-history of supporting agriculture and garden-based learning in schools through our mini-grants, workshops, conferences and written garden-based education materials. As interest in school gardening increased in recent years, MAC responded with available resources to more and more requests from educators in nearly every community across the state. They were all asking for additional information on how to garden, curriculum connections, workshops, training, on-site technical assistance and, of course, the funds to support these garden-based. In 2012, MAC developed an

expansive garden-based resource that provided both web resources and direct support that offered the tools and training that enable Massachusetts teachers to initiate new school gardens or expand existing programs.

During the Year 2013, MAC worked to build on the efforts carried out in 2012 to expand the Garden-Based Resources for teachers who are looking to start or increase their school gardening efforts with students. More than four hundred and eighty teachers directly benefitted from professional development workshops held during the year 2013 and twenty schools received direct support through garden mentoring reaching more than 1,200 students directly. These twenty schools represent an exponential number of teachers and students as the school garden program develops, expands and advances into future years. The work encompassed three new initiatives that provide additional tools and training for Massachusetts educators for garden-based and nutrition educational resources with strong connections to agriculture, nutrition and local farms.

3. Project Approach

Through this project, Massachusetts Agriculture in the Classroom (MAC) worked throughout the year 2013 to build on the efforts carried out in 2012 to expand the Garden-Based Resources for teachers who are looking to start or increase their school gardening efforts with students. The work encompassed three new initiatives that provide additional tools and training for Massachusetts educators for garden-based and nutrition educational resources with strong connections to agriculture, nutrition and local farms. The three initiatives carried out in 2013 are: A) Development of three new How-to-Guides for Getting Started in the School Garden to provide technical support for three obstacles to school gardening with added video instruction; B) Garden-based Professional Development Workshops for teachers taught by school garden educators collaborating with specialty crops farmers; C) Enhanced School Garden Mentoring with connections to local specialty crops farms. All three projects aimed to promote increased student knowledge and interest in gardening, nutrition and consumption of fruits and vegetables and will provide educators statewide with the resources to develop successful school gardens promote nutrition education and connect to local specialty crops farms.

Initiative A: Development of three (3) new technical guides to address critical problems that prevent starting and sustaining school gardens with additional video instruction;

> Massachusetts Agriculture in the Classroom dedicated a great deal of time during the year researching and writing three new comprehensive How-To-Guides for Getting Started in the School Garden. MAC's collaborations with teachers for our 2012 Garden-Based Education Project identified three key obstacles for those engaged in starting or sustaining a school garden nutrition program. The new guides have been designed to provide horticultural and technical advice and resources to address these barriers to development of a successful school gardening program.
>
> MAC's program associate developed the guides working in collaboration with MAC's Executive Director and Board. School garden educators provided guidance and review.

In addition, MAC's project partners, The Massachusetts Nursery and Landscape Association, Massachusetts Flower Growers Association, Specialty Crops Members of the Massachusetts Farm Bureau Federation, the Massachusetts Garden Club Federation and Master Gardener provided guidance and review throughout the process.

The three new guides were researched, written and reviewed. Each How-to-Guide offers an overview of the topic with extensive background information and then provides guidelines to assure successful implementation. All three guides are now posted on line in PDF format as well as HTML. During the fall of 2013 and throughout 2014, the new guides have been promoted to educators across the state.

In addition, a web survey has been added to each guide to assist in identifying who is using these guides and what adaptations are made, as well as suggestions for additions and improvements.

Video's from Workshops Linked to How-To-Guides

MAC also videotaped the 26 workshops conducted during our two full days of Garden Skills Workshops and Demonstrations for the School Garden. These workshops were taught by school garden educators and horticultural/green industry professionals working with teachers. Each video was recorded by our Technical Associate, Christopher Szkutak, and then processed through video editing software. It took approximately 2 hours per video to edit the raw footage into an educational video. We then went through the videos and selected the best quality videos for uploading. We are continually in the process of updating the videos and adding new videos to the website to insure we have quality content.

Fourteen of the best of these videos have been uploaded. A page was created a page to link to the videos that will also have a feedback form for those who view the videos. The videos we have taken are hosted on the website Vimeo; however, they are available to be seen on our website at the link:
http://www.aginclassroom.org/School%20Gardens/videos.html.

List of Videos

Square Foot Gardening

Pallet Gardening

Soils

Building a Raised Bed

Planting a Tree

Composting

Scheduling Veggies

Lasagna Layering Garden Bed Preparation

Double Digging Garden Bed Preparation

Planting in Containers

Pruning

Seed Saving

Mulch in the Garden

Building a Hoop House

Fall and Winter Crops

Ornamental Plants for the School Garden

Bokashi Compost

Planting a Pollinator Garden

Cooking in the Classroom

1. **How to Guide for Getting Started in the School Garden # 1:** A Fall Focused Garden Guide for Massachusetts School Gardeners

It is possible to have beautiful, educational and productive gardens in Massachusetts in the fall months when school is in session. Our guide: Your Fall School Garden: a Fall Focused Gardening Guide for Massachusetts School Gardeners lays out techniques, strategies, timing and advice for the fall in Massachusetts educational gardens, using inexpensive and safe materials. School gardens in Massachusetts can use quick growing greens to sneak in a fall planting and keep slow maturing melons, squash, dry corn and beans alive over the summer for a fall harvest. We can protect tender plants, create micro- climates to stretch hardiness zones, and turn our attention to reliably hardy perennials. Best of all, we can use these challenges to spark interest and problem solve with our students in the garden, so that they can come up with innovative and creative designs and ideas to address these challenges. This guide lays out these strategies in a simple, easy to understand way that can be helpful as a single page hand out on a particular plant or topic, or a whole booklet.

The guide includes a recommended calendar of tasks week-by-week and sixteen strategies for successful fall-focused gardens from: short season annuals and indoor gardening to tough perennials, herbs, raspberries, garlic, grains and fruit trees, along with techniques such as harvesting and curing, microclimates, row covers, tents, cloches, low-tunnels, cold frames, high tunnels and greenhouses. It also addressed food storage and

preservation and other uses for the garden in fall and winter. Resources, budgets and supplies are also provided.

2. How to Guide for Getting Started in the School Garden # 2: MAC School Garden Start-up Workbook

Our "School Garden Start-Up Guide" is a workbook for school garden leaders. This guide leads a school through the necessary steps of planning to start up a school garden, and serves as a record-keeping document to share, for the gardens continued success and longevity. This guide has been developed largely based on observation of our mentor schools and what they need as they work through the process of getting started. The guide leads a current or aspiring school garden leader or team through an assessment and planning process covering many horticultural and community factors relevant in gardening in a school setting. As the reader(s) progress through the workbook, they will generate written planning documents, gather contacts and community resources, create a working budget, make a five year plan, a safety plan, a curriculum plan, and other important areas to cover as they move forward. All along they get suggestions about involving the school community and other volunteers for greater impact, ownership and ease of labor in their school garden. This careful planning and record keeping from the start will ensure continued success in the school garden.

The guide includes an overview of MAC's resources, and step-by-step suggestions for getting started – from assessing your talents resources and local situation to creating a garden map. It then outlines making a plan including mission, vision and goals, curriculum goals, garden design, needed supplies and activities, plants, budget and year plan. Then move on to building a garden support system of parents, local farmers and green professionals, volunteers and other local businesses. Other items include a appreciation, record keeping and evaluation, a garden safety plan, succession in garden leadership, grants, sharing the garden with the community and sample budgets, five-year plans, start-up check list, curriculum resources and other resources. The goal is to draw upon your local resources and make your garden relevant to the unique culture of your community and school and therefore your students.

3. How to Guide for Getting Started in the School Garden # 3: Summer Care for the School Garden

Planting and care in school gardens in Massachusetts can be a challenge. The school year skirts neatly around peak growing season, the harvests of summer vegetables such as tomatoes and cucumbers, and the time that gardens need the most care. In fact, the school year was designed to do just that, so that children could help out on their family farms during the growing season.

This guide looks at horticultural and community solutions to the summer in your school garden. Whether you are lucky enough to have a summer program, or funding to hire a summer caretaker, or you need to recruit community support and volunteers, there are many techniques helpful for a low maintenance summer garden. It looks at different options to create gardens that are low-maintenance over the summer through the use of mulch, watering systems, careful plant choice, dormancy and other horticultural

strategies. It also looks at successful ways school gardens are maintained by parents, school staff, and summer programs and outside volunteers and organizations. Through careful assessment, and choosing between a menu of options and strategies based on their individual situation, any school garden can have success with their summer care.

Each of the three new How-to-Guides for the School Garden was linked to a web survey so that we could gain feedback from teachers and other educators who used these resources. The three guides are: A Start-Up Guide for School Gardening, a Fall Garden Guide and a Summer Care Guide for the School Garden. We received ten to twelve feedback comments for each guide through the web survey. These reviews were very positive. Educators told us how useful these new resources were for them in their school gardening efforts.

We also use these guides with each school garden that we mentored during the year 2014 and those we are working with in 2015. In addition we taught a number of workshops for teachers through our own conference and for other organizations who are reaching out to teachers and educators who are new to school gardening. At each workshop and conference and with each new school garden we introduced these new guides to teachers to provide useful tools to help them overcome the barriers that have kept them from starting the garden. The feedback has been overwhelmingly positive. Teachers are so grateful that these resources are available for them to use. The Start-up Garden has been especially useful for our newly mentored schools. Below are comments from teachers.

At each workshop and with mentored school gardens we share the **Start-up Guide for the School Garden** with teachers as an essential resource, and show them how it can help them through the process. The response has been very positive and teachers tell us they use it as a guide book. It has been very helpful for us to be able to have this resource to share with teachers, as it addresses most every question they ask. The guide is leading teachers step-by-step through exercises to do with their garden committee and their students and emphasizes an approach that starts with planning. Teachers are using this as a go-to-guide for where to start when beginning the garden as well as a record keeping book so that transfer of leadership is easier down the line. Many teachers who have been overwhelmed with all of the information out there tell us this guide is targeted and specific. This helped them with something useful for their specific situation that is an inexpensive and school based way to start a garden.

Web based feedback on the School Garden Start-up Guide tells us that this guide has been the most useful resource for those getting started in the garden. Comments include: Thank you for such a terrific outline for starting the garden, I appreciate the step-by-step guidelines, the planning section was so useful, I feel I can share this guide with other teachers at my school and the administration to get the process started. One question that was submitted through the form was a question about the safety of using local town compost in garden beds.

The Fall Gardening Guide is full of worksheets on particular topics and many teachers have used this to plan their fall focused gardens. We introduce this guide with every school we mentor and also at workshops. We emphasize the fall as an ideal time to get started with students in the garden. Teachers at the Cuniff School in Arlington were inspired by the raspberry sheet to plant fall bearing raspberries. The Sullivan School in Worcester and many others planted garlic.

Web-based comments have also been very favorable. Teachers told us what a great to plant a garden to match the school season, I can't wait to plant garlic; I started plants in August and was ready to garden with my students when school began, I can use kale from the garden to connect with all areas of the curriculum, and I built a high tunnel with my students and was able to grow crops through December.

The **Summer Care Guide** provides a useful resource for teachers and administrators who are hesitant to start a school garden because of fear of what will happen during the summer vacation. During our school garden mentoring and workshops for new school gardeners the issue of summer care always arises. By introducing the educators to the guide and the suggestions provided we help teachers to find a solution that will meet their own situation. The guide offers signup sheet examples for getting families involved in summer care. Teachers have been taking this simple but effective idea and successfully divided up the responsibility for care for their gardens. Web comments are: Truly useful; great ideas for summer care; we created a summer schedule and families signed up; the mulch and drip irrigation really helped reduce the summer maintenance; thanks for the tips we started a garden internship.

In conclusion, these new guides have been very useful to teachers and other educators and are also helpful to us as we answer so many questions from educators who are seeking to start a new garden. They provide us with a useful tool that we can easily share. They offer ideas, worksheets and examples of how other teachers are overcoming barriers to the school garden.

The funds that supported this project were used only to support the development of garden-based materials and trainings with links to farmers who specialized in nursery, greenhouse and growing vegetables and fruits. This included three new How-to-Guides for the School Garden, twelve garden-based workshops and mentoring for twenty new school gardens. With each of these grant elements connections were made from the school garden to local farms and farmers. These included nurseries, greenhouses and farms that grow vegetables and fruits. No other commodities were supported during the grant and no other farmers were connected to educators. No crops other than fruits and vegetables were included in the educational aspects of the trainings, guides or mentoring.

Initiative B: Twelve (12) professional development workshops for teachers taught by school garden educators collaborating with specialty crop growers

Massachusetts Agriculture in the Classroom is pleased to report, that during the year 2013 twelve Garden-Based professional development workshops were conducted for Massachusetts educators reaching a total of 489 educators. Four of the garden-based

workshops were held during our winter "Growing Minds through Massachusetts Agriculture" Conference on March 9, 2013, which reached a total of 140 educators.

An additional four workshops were conducted during our fall "Greening the School" Conference on November 9 which reached 113 educators. During both of these conferences, additional sessions also covered garden-based topics. Eight of these 52 workshops were supported by the grant.

Two full day garden education workshops were held as part of our Summer Workshops on the Farm. One workshop covered STEM Connections to the School Garden on July 30 and the second; a new full day conference offered 13 workshops focused on Curriculum Connections to the School Garden, 86 educators attended on July 18. Additional summer workshops addressed food preservation, pollination, herbs, soils, nurseries and more.

During the spring and fall, MAC organized two full Days of Garden Skills Workshops and Demonstrations for School Garden Educators held on farms. Each day offered hands-on demonstrations conducted by farmers and school garden educators, with a different workshop or demonstration starting each half hour. These full days of garden workshops and demonstrations were free to all garden educators and were very popular, with teachers coming from across the state to each Session. A total of 150 educators attended. The twenty six workshops conducted during the two full days of garden skills workshops and demonstration were videotaped, so that the workshop sessions could be added as a resource to the How to manuals on the web site. The first event was held on April 20 at Tranquil Lake Nursery in Rehoboth and the second was held on October 19 at the New England Small Farms Institute in Belchertown.

MAC met the objectives for the year 2013 by developing and conducting the twelve garden-based professional development workshops. MAC worked with school garden educators and project partners to plan the twelve workshops. Each workshop was taught by an experienced school garden educators and/or farm/horticulture educator. MAC conducted pre-and-post assessment at each workshop, using a quiz with ten true and false questions regarding materials that would be taught during the workshop. Participants were asked to complete the test before each workshop began and again afterwards. We also conducted traditional evaluation to determine the effectiveness of each workshop. The pre and post test evaluation is now being reviewed and will be tabulated in December and included in the final reporting.

Initiative C: Enhanced garden mentoring programs with connections from Massachusetts specialty crop growers to school gardens.

In 2012, MAC piloting a Garden Mentoring Program in twenty Massachusetts Schools. We developed a draft mentoring manual and developed initial workshops to train garden mentors. In 2013, MAC maintained a relationship with these initial twenty schools, working with them to secure long term mentoring support. We continued visits to **our 2012 mentored schools in 2013.** We helped these schools move along through

next steps, deepen their curriculum connections, forge stronger links to their local farms and community resources, and trouble-shot with them about their horticultural success in their first year and made gardening plans based on this for the year to come.

In 2013, MAC also provided mentoring for twenty new 2013 school gardens. The process of applying to be a mentored school was formalized, with the creation of an on-line mentoring application on the MAC website. The application asks schools to have achieved a certain level of commitment and support, as well as planning. Our new 2013 mentored schools got off to a great start. Many of them were able to come to our three seasonal conferences and learn from our last years schools in our panel discussions! Below is the list of 2013 mentored schools with Lead School Garden Educator: At many schools more than one classroom was involved in the mentoring:

20 Schools Mentored in 2013

1 **Arnone Elementary**

135 Belmont Street Brockton, MA 02301

Lead School Garden Educator: Christina Limon

2. **Belchertown High School**

142 Springfield Road Belchertown, MA 01007

Lead School Garden Educator: Louise Levy

3. **Claypit Hill School**

40 Adams Lane Wayland, MA 01778

Lead School Garden Educator: Molly Faulkner

4. **Dana Hall School**

45 Dana Road Wellesley, MA 02482

Lead School Garden Educator: Catherine Buttner

5. **Fort River School**

70 South East Street Amherst, MA, 01002

Lead School Garden Educator: Jane Costello

6. **Gateway Regional High School**

12 Littleville Road Huntington, MA 01050

Lead School Garden Educator: Michele Klemaszewski

7. **Foxboro Regional Charter School**

131 Central Street Foxborough, MA 02035

School Garden Educator: Marylee Mutrie

8. **Hawlemont Regional School**

10 School Street Charlemont, MA 01339

Lead School Garden Educator: Jean Bruffee

9. **Horace Mann School for the Deaf**

40 Armington Street Allston, MA 02134

Lead School Garden Educator: John Wilcox

10. **King Kids Daycare**

406 Forest Street West Bridgewater, MA 02379

Lead School Garden Educator: Julie Smith

11. **Mullen-Hall Elementary**

120 Katherine Lee Bates Road Falmouth, MA 02540

Lead School Garden Educator: Josh Leveque

12. **North Street Elementary School**

60 North Street Grafton, MA 01519

Lead School Garden Educator: Trea Byrnes

13. **Ottoson Middle School**

63 Acton Street Arlington, MA 02476

Lead School Garden Educator: Lisa Lambert

14 **Selser School**

12 Dare Way Chicopee, MA 01022

Lead School Garden Educator: Kristin Pisano

15. **Stoughton Extended Day Care**

Edwin A. Jones Early Childcare Center

137 Walnut Street Stoughton, MA 02072

Lead School Garden Educator: Linda Clark

16. **Saint Francis of Assisi School**

850 Washington Street Braintree, MA. 02184

Lead School Garden Educator: Brian Cote, principal

17. **Temple Shalom Pre School**

175 Temple Street Newton, MA 02465

Lead School Garden Educator: Johanna Perlin

18. **Tri County Schools**

203 East Street Easthampton, MA 01027

Lead School Garden Educator: Danielle Crescionne

19. **Weston Public Schools**

89 Wellesley Street Weston, MA

Lead School Garden Educator: Megan Bettencourt

20. **Wildwood School**

71 Strong Street Amherst, MA, 01002

Lead School Garden Educators: Ms. Mangala and Sarah Berquist

The garden mentoring handbook was been rewritten, using the experience of the past two years to create a useful tool for those assisting school garden educators. It was enhanced to provide information and resources for long-term support as well as information on the many specialty crops grown in Massachusetts and how to access local farms that grow these crops. It covers the steps schools are advised to go through in starting their gardens, as well as familiarizes mentors with MAC and other resources they can use when working with schools. It looks at how to establish a successful mentoring relationship with a school, and gives examples of written agreements and expectations. It includes check-lists of areas to consider when starting a garden for easy use by a mentor, and resources and support in working in a school institutional environment for people who may not be familiar with it as they do not work in a school themselves. It familiarizes mentors with areas of learning they will need to address when transitioning their gardening knowledge in a sunny home garden to the more challenging environments that many school gardens are located in. It also covers documentation and other areas of reporting such as our pre and post test, and communicating with MAC.

Four additional training workshops of five hours each were held during the year. These workshops were open to all volunteers assisting with mentored schools. The trainings reached a total of 80 garden resource people.

Pre and post test assessment tools were designed during the spring of 2013 and distributed to all mentored schools to collect information on knowledge and attitudes for both the garden leaders and the students. This test for garden leaders was designed to cover basic gardening information and ways to get resources that help school garden leaders. The test for students covers recognition of Massachusetts vegetables, as well as their experiences eating vegetables, and their knowledge of farms and farmers markets in their community. Teachers who have participated in the garden mentoring program have also been asked to track the snacks brought to school by their students for one week prior to beginning the garden-based education program. Data was collected throughout the year. These tests will help us to evaluate what schools in our program are learning and

doing, as well as act as a guide for schools in areas they should cover in their garden program.

Mentoring continued for all 2013 schools through 2014, with a final step of transitioning all mentored schools to a long-term garden mentor from their local community. MAC worked with the Project Manager and MAC's Board of Directors and with cooperating partners to recruit volunteer mentors for this long-term support. We worked with the Garden Club Federation of Massachusetts and the local farm community to find this long-term support. MAC will continue to work within its network of educators, including more than 13,000 educators, principals and superintendents across the state to promote the garden volunteer program and to identify the most important mentoring needs for school garden programs.

4. Goals and Outcomes Achieved

Goal # 1: To improve the success of school garden nutrition education programs in taking the garden full cycle from seed to harvest and eating.

Performance Measure: Number of school gardens educators who work with MAC through workshops and mentoring who planted a school garden and are able to maintain the garden through to a successful harvest with their students.

In 2012, Massachusetts Agriculture in the Classroom worked with 427 educators through garden-based workshops and an additional 20 schools and 20 school garden educators through direct garden mentoring. In 2013, MAC reached 489 educators through our workshops and worked with twenty schools from 2012 for a second year, and twenty new schools for 2013 through our garden mentoring, reaching a total of forty schools mentored during the year and more than one hundred twenty school garden educators. The increase in school garden educators reached in 2013 is from 447 school garden educators to 609 school garden educators trained or an increase of 36.2%.

In the fall of 2012, MAC communicated with the educators reached through our workshops and mentoring to determine how many had been able to plant and cultivate a garden to harvest with their students with serving of foods from the garden. Of those who responded we were able to determine that (35) had existing gardens that they were working to expand and (52) had developed new gardens during the year 2012. Most all had been successful in serving something from their garden to their students. In some cases the teachers worked as teams, so more than one teacher represented the same school garden. An additional (124) educators hoped to start a garden in 2013 or later.

In the fall of 2013, MAC communicated with the educators reached through our workshops and mentoring to determine how many had been able to plant and cultivate a garden to harvest with their students with serving of foods from the garden. Of those who responded we were able to determine that (62) had existing gardens that they were working to expand and (88) had developed new gardens during the year 2013. All had been successful in bringing some crops to

harvest and most had been permitted to serve something from their garden to their students (a few schools give to food banks). In some cases the teachers worked as teams, so more than one teacher represented the same school garden. An additional (140) educators hoped to start a garden in 2014 or later. This represents a 62 percent increase in expanded gardens in 2013 and a 69.5 increase in new gardens in 2013. Of these schools 86 % were successful in growing something in their school garden which students were able to eat, taking the garden full circle from seed to harvest and increasing nutrition.

Goal #2: To expand awareness of Massachusetts Specialty Crops among students involved in garden-based education programs.

Performance Measure: Number of students involved in garden-based education program supported by mentoring - anticipated as 1200 in 2013.

During the year 2013, Massachusetts Agriculture in the Classroom continued mentoring the twenty school gardens that we formed a relationship with in 2012 and expanded to mentor twenty new schools in 2013 that were just starting a school garden. A simple 10 question pre test was developed during the year to assess how many Massachusetts grown fruits and vegetables students could recognize, both in the field and in the market, as well as how many they have eaten in the past. This test was administered to students at the forty school gardens during the year 2013. A post-test was administered, with a goal to identify the increase in ability to name local fruits and vegetables as well as those that have been eaten.

We anticipated as least a 100% increase in the ability to identify Massachusetts specialty crops. Twelve of the twenty schools mentored in 2013 provided both the pre and post test results for their gardens. To do this they post tested in June for the spring gardens. When the results were tabulated from these 12 schools the percentage increase was 121.60. In a few of the schools closer to Boston and in wealthier suburbs, the students were able to recognize most all fruits and vegetables before and after the school gardening experience.

	Pre Test	Post test	Percentage
School 1	2	4	100
School 2	2	4	100
School 3	2	5	150
School 4	3	6	100
School 5	3	8	166
School 6	3	9	200
School 7	4	6	50

School 8	4	8	100
School 9	4	10	150
School 10	5	9	80
School 11	8	10	20
School 12	10	10	0
Total	50	89	121.6 %

Goal #3: To increase the consumption of Massachusetts Specialty Crops among students involved in garden-based education programs.

Performance Measure: Number of students involved in garden-based education program supported by mentoring - anticipated as 1200 in 2013.

During the year 2013, Massachusetts Agriculture in the Classroom continued mentoring the twenty school gardens that we formed a relationship with in 2012 and expanded to mentor twenty new schools in 2013 that were just starting a school garden. We asked educators involved in these school gardens to track the snacks brought to school by their students for one week prior to beginning the garden-based education program. Once the garden program was completed and crops harvested along with tasting of fruits and vegetables, teacher were asked to again track the snacks that students bring to school. We received results from 10 teachers. These teachers took two samples during one week in the spring and took another sample on two days during one week in June or the fall depending on the school garden. We anticipated a 15% increase in locally fruits and vegetables. The increase measured at the ten schools was 22.71%

	Pre Test	Post test	Percentage
School 1	3	4	33
School 2	4	4	0
School 3	4	5	25
School 4	5	6	20
School 5	5	7	40
School 6	6	8	33
School 7	8	9	12.5
School 8	8	10	25

School 9	9	11	22
School 10	12	14	16.6
Total	64	79	22.71 %

Goal #4: To increase awareness of local farms and farmers that produce specialty crops for students involved in garden-based education programs.

Performance Measure: Number of students who participate in the garden-based education programs supported by garden mentoring - anticipated as 1200 in 2013.

During the year 2013, Massachusetts Agriculture in the Classroom continued mentoring the twenty school gardens that we formed a relationship with in 2012 and expanded to mentor twenty new schools in 2013 that were just starting a school garden. A simple pre assessment activity was developed during the year to identify the number of local farmers prior to the garden-based education program. This test was administered to students at most of the forty school gardens during the year 2013. A post-test was administered either in the summer or in the fall. Our goal was to measure the increase in the number of local farms and farmers the students are able to identify following the garden-based education project. We anticipate as least a 100% increase in the ability to identify a local farm or farmer and the crops they grow. Twelve schools completed the pre and post testing and provided results. The total increase was 100% with some schools being able to name more than one farm or farmer.

	Pre Test	Post test	Percentage
School 1	0	1	100
School 2	0	1	100
School 3	0	1	100
School 4	0	1	100
School 5	0	1	100
School 6	0	2	200
School 7	1	1	00
School 8	1	1	00

School 9	1	2	100
School 10	1	2	100
School 11	1	3	200
School 12	2	4	100
Total	7	15	100%

Throughout the year 2013 and continuing in 2014, Massachusetts Agriculture in the Classroom reviewed comments from teachers and other educators regarding the workshops, How-to-Guide, Videos and School Garden Mentoring. We used this feedback from personal communications, web feedback forms, evaluations and garden mentoring interviews to improve each guide, workshop and the mentoring experience. The feedback has been overwhelming positive and speaks to these resources for their value to educators in starting and maintaining a school garden as well as to the benefit to the students.

The results of these measured assessments also show that the workshops and school garden mentoring showed a 62 percent increase in expanded gardens in 2013 and a 69.5 increase in new gardens in 2013. Of these schools 86 % were successful in growing something in their school garden which students were able to eat, taking the garden full circle from seed to harvest and increasing nutrition.

In addition, the pre and post test assessment that was conducted with the students involved in the school garden program showed an 121.6 % increase in the ability to identify Massachusetts specialty crops, and a 22.71 % increase in fruits and vegetable snacks in the school lunches as well as a 100% increase in the ability to identify a local farm or farmer and the crops they grow.

5. Beneficiaries

The Project "Strengthening the Connections between Agriculture and the School Garden, Phase II" directly supported classroom teachers and their students across the state by providing tools and training to assist in developing and enhancing their garden-based education programs. These tools include web-based resources that are available to all educators: such as three new garden guide resources, the mentoring manual and pre and post assessment tools for school garden educators. In addition, this project supports the Massachusetts nursery, garden center and greenhouse industry as well as the farmers who grow vegetable seedlings for market, as school garden educators connect with local farms and nurseries to purchase needed garden materials.

More than four hundred and eighty teachers directly benefitted from professional development workshops held during the year 2013 and twenty schools received direct support through garden mentoring. These twenty schools represent direct contact with more than 1,200 students and an exponential number of teachers and students as the school garden program develops expands and advances into future years. The three web-based guides and mentoring resources are available to

all teachers in Massachusetts and elsewhere, as well as after school educators and other youth educators who garden with students. During the year 2014, we asked twenty school garden educators to review the guides and give us direct feedback.

As more garden-based education programs are developed across the state, this project will also indirectly support the fruit and vegetable industry throughout the Commonwealth by building an awareness of the value of fruits and vegetables and the agriculture that supports these crops. As children increase their knowledge and consumption of fresh fruits and vegetables, as well as the connections to locally grown foods, they will learn to make choices about the foods that they eat at home and at school. They will also take these lessons home to their parents. Since these new attitudes about eating fresh fruits and vegetables can last a lifetime, there is potential to build an ever stronger interest and market for locally grown fruits and vegetables.

6. Lessons Learned

2013 was a busy year for Massachusetts Agriculture in the Classroom (MAC), as we developed additional garden-based resources, trainings and mentoring to assist teachers with their school gardening efforts. During the year 2013 and 2014, we worked to promote the web-based resources developed in 2012 and 2014 and to collect data on the usefulness of those garden-based resources and ways they could be expanded and improved. We found that the interest and participation in MAC's developing garden-based education resources throughout both years has been immense and very positive. The garden-based lessons helped educators to make the connections from the garden to the classroom. The thirteen How-to-Guides developed in 2012 was essential for those teachers who have little garden experience, offering background information, step-by-step instruction and troubleshooting. The three new guides developed in 2013 were especially useful in addressing the three most difficult barriers for teachers looking to start a new school garden. The Garden directories have helped teachers to connect with other local teachers who have been successful with school garden, and with educational resources or the local businesses that can provide plants, seeds, tools and other supplies for the school garden. As in 2012, it took us all year to develop the new three new How-to-guides, so we collected data on their use in 2014, asking our newly mentored teachers to review the guides and give us feedback, while also providing for assessment on the website. These new guides are very comprehensive and the reviews from teachers were very positive, with all three guides found to be useful tools for educators seeking to get deal with the barriers associated with getting a new garden started, carrying the garden through the summer months when school is not in session and planting fall gardens that can be harvested in the late fall and into the spring. We continued to promote these guides in 2014.

In 2013, we improved on our data sampling for garden-based workshops based on lessons learned during 2012. Throughout the year, we distributed the pre-tests and asked participants to fill them out prior to the beginning of each garden-based workshop and then collected the pre-tests as the session began. Posts tests were distributed after the workshops. This should improve on our data sampling. We also asked participants to give us a number to represent the percentage increase in garden-based learning.

Once again in 2013, School Garden Mentoring was the most challenging and also the most rewarding aspect of the garden-based education project as it brought us into direct contact with educators as they worked to develop their school gardens. The lessons learned in 2012, provided

a strong ground work for the mentoring experience in 2013. During the year we developed pre and post assessment for gardens participating in mentoring. We also standardized the format for the mentoring experience including pre- visits to gardens and follow up visits during the year. In addition, an application process was established so that schools applying for mentoring were required to meet a level of preparation and organization. The garden mentoring guide and training were also reviewed and expanded.

In 2013, we were much more successful in collecting assessment from educators. The data has been reviewed and included in this report. For 2014, we have also established a garden voucher program that will give each school a small stipend for garden materials purchased at local farms. With these school garden vouchers, the new mentoring application, and pre and post tests for teachers who are being mentored as well as the students involved in these school gardens, MAC will be much more successful in collected data in future years.

The biggest lesson that we learned in 2013 and continuing through 2014 is that the need for these garden-based resources for teachers is huge. Our How-to Guides and Garden-Based Lesson provide a strong start for schools interested in starting a school garden. However, they continue to ask for more and more resources while utilizing the many resources that are already available through MAC. A special need is the connection from the school garden to the classroom and the curriculum standards. We expanded our workshops and conferences to include more sessions on curriculum connections, taught by school garden teachers. At the same time the need for basic gardening skills is critical. We extended the school garden mentoring for two years with site visits across two garden seasons to strengthen the support. We also instituted a school garden blog to connect the teachers and offer timely garden tips. We will make garden-based lesson ties to the curriculum a continued commitment. We are also now looking for sustained support for the school garden mentoring

7. Contact Person

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8. Additional Information

Link to How-to-Guides for the School Garden

http://aginclassroom.org/School%20Gardens/How-To-Guides_For_School%20Gardening/How-To-Guides.html

Organization: Community Teamwork, Inc. - New Entry Sustainable Farming Project

Project Title: Expanding Beginning Farmers' Success with Specialty Crops project

FY 2012 12-25-B-1467

Final Report:

This report covers activity under the *Expanding Beginning Farmers' Success with Specialty Crops* project, for the period September 1, 2012 – September 30, 2014.

1) A Project Summary consisting of the following information:

a) Background of the initial purpose of the project, including the specific issue, problem or needs that was addressed by the project

Many beginning farmers, particularly those from socially disadvantaged groups, are challenged to meet expected performance levels needed for financial success in producing specialty crops. The purpose of the project was to significantly improve the supply, quality, and marketability of specialty produce grown by beginning farmers in Massachusetts, with an emphasis on immigrant and refugee farmers who are connected to New Entry. We focused on those crops that are particularly challenging to producers, yet that have strong demand to CSA and farmers' market customers. Our target crops focused on field greens and field-grown heirloom and slicing tomatoes.

b) Description of the importance and timeliness of the project

This project is timely since the number of farmers' markets across Massachusetts grew to an estimated 258 in 2012, from only 8 in 1980. Massachusetts Department of Agricultural Resources (MDAR) and the Federation of Massachusetts Farmers' Markets (FMFM) estimated that 500-650 farms are selling at these markets, with estimated combined annual revenues of $12-$20 million. Farmers' market sales are a major entry point for hundreds of small growers and a mainstay for just as many larger and more established producers. A preponderance of products purchased at these markets is specialty crops - fresh vegetables and fruits sold by the farmers who grow them. There has also been an increase in CSA activity over the years. For our own World PEAS Food Hub, our customer base has increased from 15 customers in 2005, to 500 customers by 2014, with an additional 1,000+ customers served through the World PEAS Food hub via other distribution channels.

2) The Project Approach (Including the following information):

a) A brief summary of activities performed and goals and / or targets achieved throughout the entire grant period. This should represent the activities/ goals and targets specified in Attachment B: Work Plan

During the Specialty Crops grant period, New Entry focused on improving farmers' performance with three types of specialty crops – lettuces, other field greens, and tomatoes –

as models to address underperformance in the face of growing demand at CSAs and farmers' markets. The core participants are 22 new growers, mostly immigrants, refugees, and beginning small-scale farmers looking to expand production and sales of these crops.

In 2013, New Entry staff conducted 9 workshops and provided 210 hours of hands-on technical assistance. In 2014, New Entry staff conducted an additional 12 workshops and provided 103 hours of hands-on technical assistance specific to specialty crops. During the grant period, we have also reached hundreds of other beginning farmers via seasonal field-based and winter conference workshops and with online resources that are produced for wider audiences. Through these activities, New Entry addressed production, harvest, post-harvest and marketing components of these target specialty crops, and expanded production and sales revenues for 22 beginning, immigrant and minority farmers who use our CSA and area farmers markets, by expanding their skills and performance in production through to direct marketing activities.

b) If the project benefited commodities other than specialty crops, indicate how the Contractor ensured that grant funds were used only to enhance the competitiveness of specialty crops. The project covered specialty crops exclusively.

c) A summary of the contributions and roles of project partners

All farmers selling to the World PEAS Food Hub are considered project partners under this specialty crops grant. We consider the production activity of these farmers noted in this report as major contributions for this project. Additional stakeholders who support this project include the Massachusetts Farm-to-School Project and the Eastern Massachusetts Collaborative Regional Alliance for Farmer Training (collaborators in training workshops). In addition, Trevor Hardy from Brookdale Fruit Farm assisted with irrigation workshops and Dr. Richard Bonnano from UMass Extension and Pleasant Valley Farm assisted with post-harvest handling and food safety workshops. Project partners also include all 500 CSA customer families and the organizations and distinct sales outlets (noted below) which support our farmers and the quality produce they grow through purchase of their specialty crops.

Specialty Crops Market Partners:

Bridgewell Homeless Drop-In Shelter
Community Homebound Senior Programs and Senior Community Centers
Somerville/Cambridge Elders
Dorchester Senior Group (Kit Clark)
Springwell Senior Group (Waltham, MA)
Elder Services of Merrimack Valley
Lahey Clinic Burlington
Lahey Clinic Peabody
Merrimack Valley Food Bank
Community Teamwork, Inc.
CTI School Age Program
CTI Daycare Services

Lowell WIC Office
Lowell Farmers Market

Restaurants/ Institutional Food Services

Journeyman Restaurant
Tufts University Dining/Food Services

Medford Farmers Market
East Boston YMCA
Lowell Community Health Center

3) Goals and Outcomes Achieved

a) A description of the activities that were completed in order to achieve the performance goals and measureable outcomes indentified in Attachment B

The following activities were completed:

Workshops

Central to New Entry's approach of advocating for specialty crop production is teaching a holistic sustainable crop production and direct marketing curricula. Specialty crops should garner high value and good net income. They need to reach their targeted markets at the best quality, showcasing what makes them "special." New Entry's educational efforts, in both the classroom and in field-based workshops, demonstrate how to master individual production areas, then how to weave these parts into a holistic farm management system. By utilizing a systems-oriented approach to teaching sustainable crop production, New Entry's growers steadily gain confidence in their ability to grow high-value specialty crops throughout New England's four seasons. Overall, we are introducing specialty crops as part of a sustainable production system program and including content regarding specialty crops in all the components we teach.

The specialty crop theories were blended into all workshops conducted by New Entry's Technical Assistance Coordinator since he began his position in October 2012. Prior to his position for New Entry, he was an Educator/Farmer Specialty Crop Specialist hired for the USDA Sustainable Agriculture Research and Education program for the Northeast Region. He ran a for-profit farm specializing in direct sales of specialty crops to over 35 restaurants per year.

Outreach announcements about specialty crops training programs were broadcast, and reminders were sent via email and phone before individual field workshops. In all cases, in addition to lecture, the theories were carried out in a field-based setting through demonstrations and using farmer growing plots as "living laboratories" during these hands-on, practical skills workshops.

Workshops were conducted as follows:

- 3/20/13 – High Tunnel Greenhouse Production: 9 participants
  (Season extension for specialty greens)
- 4/17/13 – Organic Fertilizers and Green Manure Cover Crops: 15 participants
  (Seeding of pea tendrils as income producing specialty crop component. Theory was demonstrated on all incubator fields)
- 5/1/13 – Raised Beds and Field Preparation: 15 participants

(Theory of raised beds was put into practice in August following wet June and July. Almost everything planted during this workshop meets the specialty crop category of "hardy fall greens")

- 5/15/13 – Irrigation and Water: 14 participants
  (Critical piece for managing disease with tomatoes. Influenced by plastic on raised beds) Trevor Hardy from Brookdale Farm partnered with New Entry to assist with the irrigation workshop.
- 5/25/13 – Small Farm Equipment and Tools: 11 participants
  (New equipment purchases were demonstrated to show effectiveness in tillage of tomato plants)

- 6/12/13 – Pest Management: 10 participants
  (Use of spun polyester cloth as a way of protecting salad greens and braising greens from flea beetles and use of organic sprays for controlling horn worm on tomatoes, cabbage worm and army worm on the specialty field greens)
- 6/26/13 – Weed Management: 9 participants
  (#1 issue for all the farmers, effects all specialty crop harvest efficiency, productivity, quality and yields)
- 8/28/13 – Cover Cropping: 10 participants
  (Demonstrated cycle of peas and oats and harvest condition status)
- 4/16/2014 – Greenhouse and High Tunnel Design: 2 participants
  (Structural integrity of greenhouses and high tunnel construction as well as maintenance; illustrated how to protect structures in extreme weather events and showed structural weaknesses of Smith Field structure lost to March winds; growers are using high tunnels for tomato and specialty greens production)
- 4/20/14 – Soil Workshop at the Groton School: 6 participants
  (Field workshop, a classroom PowerPoint lecture, then followed up with a field workshop to demonstrate how to pull and submit soil samples to balance nutrients for specialty crop recommendations)
- 4/30/14 – Soil tests: 8 participants
  (Demonstrated how to pull soil samples, interpret results and calculate soil amendment rates for specialty crops)
- 5/7//14 – Bed and Soil Preparation: 9 participants
  (Demonstrated how to evaluate soils prior to planting; the effects of compaction on soil quality and nutrient availability; options for tillage for soil prep prior to direct seeding or transplanting of specialty crops)
- 6/4/14 – Tractor and Small Equipment Workshop: 5 participants
  (Demonstrated equipment safety)
- 6/18/14 – Cover Crop Strategies: 26 participants
  (Covered crop rotation and cover crops variety selection with emphasis on how to integrate green manure cover crops into seasonal cash crop schedules. Eastern Mass CRAFT was a co-sponsor of the workshop)
- 7/2/14 – Organic Pest Management: 6 participants
  (Covered organic management of insect pests as well as techniques to attract beneficials)
- 7/16/14 – Organic Weed Management: 6 participants

(Covered identification and management of vegetable crop weeds with emphasis on cover crops as smother crops and appropriate mechanical devices for weed management)

- 7/30/14 – Organic Management of Vegetable and Crop Disease: 7 participants
  (Covered how to identify vegetable crop diseases and organic techniques for mitigation)
- 8/20/14 – GAP Protocol and Post Harvest Handling of Fresh Fruits and Vegetables: 4 participants
  (Covered how to safety protocol for handling fruits and vegetables)
- 9/14/14 - Tomato Grading at the World PEAS Packing and Distribution Site: 6 participants
  (Covered quality control of tomatoes delivered to the World PEAS Food hub for distribution to customers)

The World PEAS Annual Farmer Meeting was held on November 26, 2012, from 6:30 – 8:30 PM at the Lowell office. The World PEAS Coordinator conducted outreach to World PEAS farmers and current year graduates for the meeting. A total of 26 individuals participated. Farmers discussed the successes and challenges of the prior production season and specific instruction was provided regarding the crop bidding process.

On December 10, 2012, New Entry co-sponsored a Farm-to-Institution workshop in collaboration with the Mass. Farm to School project to educate 12 New Entry farmers about partnering with local schools, hospitals, and universities for specialty produce sales. Outreach was performed through New Entry's network of farmers.

On March 24, 2013, Staff conducted the annual Winter Farmer Summit, with 20 New Entry farmers. The summit covered the topics of selling to institutions and food safety. Simca Horwitz of Mass Farm to School Project and Dr. Richard Bonanno of UMass Extension gave presentations on institutional market opportunities for our New Entry community of growers, food safety protocol on farms, and the upcoming FDA/FSMA regulations regarding food safety.

On November 26, 2013, staff held its annual World PEAS Food Hub meeting with 17 World PEAS farmers to discuss financial performance, get feedback on the 2013 growing season, and present crop bidding process.

Staff also conducted specialty crops workshops at a number of statewide conferences during the project period. On January 17, 2013, staff conducted a Green Manure workshop at the annual Connecticut Fruit & Veg Grower Winter Meeting, including information regarding specialty field peas and oats cover cropping. Outreach was performed by Connecticut Extension. A total of 195 people participated. Of all the workshops, it was voted by participants as the 2nd best workshop, out of approximately 8 workshops. Follow up phone calls led to New Entry staff being invited to give a presentation at the Connecticut NOFA field summer workshop at a community farm at Simsbury (14 participants) including practical skills training. A New Entry graduate (from 2010), who lives in Connecticut was one of the participants. After attending the training, she began to plant, harvest and sell oats and pea tendrils as a specialty cash crop.

On February 28, 2013, New Entry staff presented on the history, logistics and best practices of the World PEAS Food Hub at the Harvest New England conference, in Sturbridge, MA. On March 2, 2013, staff presented an introduction to Farm Business Planning at the NOFA

Connecticut Winter Conference to 35 people. Integral to farm business planning is having a marketing plan, and an important component of the marketing plan is targeting specialty crops as a farm production component. We focused on restaurant demand, which includes tomatoes and field green production. Baby lettuce and arugula work well due to their quick turnaround from seed-to-harvest. During the workshop we discussed the value of fully ripe heirloom tomatoes which are the highest value to restaurants, as opposed to volume sales of partially ripe tomatoes. Restaurants want to be able to use the tomatoes on the day-of delivery. We discussed the risks involved in marketing a fruit that has value for 3 days. The small-scale farmer is best positioned to provide this lucrative specific service to restaurants with a customer base which demands high quality produce.

On March 19, 2013, staff participated in a Buy Local Trade Show Panel, to present strategies of creating direct partnerships with local farmers and overcoming challenges of higher costs from those relationships. Approximately 25 people attended the presentation. The event was sponsored by the Sustainable Business Network of Greater Boston. We discussed how specialty crops are one of the best niches to exploit from a growers perspective. The best strategy is to cultivate direct relationships with buyers (cut out the middleman) to get the highest price. We discussed strategies for direct sales to restaurants, stores, farmers markets and CSAs which do not go through institutional buyers. If growers still have volume not being sold, then farmers should work through other channels to discount produce after they have exercised their best income options.

On March 22, 2013, staff presented a workshop on green manure cover crops in Maine to the Johnny's Seeds R&D and Sales staff. Johnny's Seeds targets specialty crop growers in the Northeast. They invited New Entry staff to assist them in upgrading their message to build sales in cover crops as part of their seed division. Integral to the talk was discussion on pea tendril as a cover crop which doubles as a specialty green for direct markets. The pea tendril varieties recommended by New Entry staff are now included in the Johnny's Seed catalog for consumers, distributed to 10's of thousands of farmers.

On July 17, 2013, New Entry held a statewide training workshop on Food Safety and Handling in conjunction with the Eastern Massachusetts Collaborative Regional Alliance for Farmer Training and the UMASS Cooperative Extension program (Vegetable Crop Specialist-Dr. Richard Bonnano). Outreach was conducted through the EMASS CRAFT list serve and Beginning Farmer Network of Mass (BFN) network. A total of 35 farmers participated. We discussed: field heat and effect on specialty greens, and washing and handling; greens which are most bruise-sensitive from excess handling after harvesting; the use of spin dryer machines for drying of post harvest handling of lettuce, arugula, all herbs, spinach, and baby lettuce; packaging to promote the business enterprise name; ideal temperatures for handling of specialty produce; breaking tomatoes down to smaller units to maximize income; and the importance of using plastic bags with vent holes to hold humidity. We distributed the USDA optimum temperature and humidity spectrum of produce information sheets, which are now posted as a resource to our New Entry website:
http://nesfp.org/resources/commercial-storage-fruits-vegetables-and-florist-and-nursery-stocks

On September 4th, 2013, Staff conducted three workshops for 10 participants in Bedford, NH, who are part of the International Institute of New Hampshire's agriculture program. The first workshop covered marketing options for farmers- both retail and wholesale. We also talked about cultivating personal skills and interacting with customers, as well as a re-cap of farmer market practices. The second workshop covered crop rotation, seed ordering and variety selection, soil, soils tests, nutrient deficiencies, soil amendments, and necessary supplies and tools. The third workshop covered safe and effective harvesting techniques, including an activity during which we created a harvest plan for farmers to increase produce quality post-harvest as well as food safety. We discussed harvesting, washing, drying, and storage timing and techniques as well as food safety issues and solutions.

On January 18, 2014, staff conducted a workshop in East Hartford, CT for an audience of 70 beginning farmers and service providers on the subject of how to interpret soil tests utilizing soil building techniques of seeding and managing green manure cover crops.

On February 2nd, staff conducted a workshop at the New Hampshire Winter NOFA conference, with 45 farmers. Staff joined Dr. Eric Sideman from the Maine Organic Farmers and Gardeners Association to present an afternoon workshop on green manure cover crops for the specialty produce grower. The sessions were scheduled as "intensive half-day" sessions for commercial organic farmers. We talked about the soil biology, the botany of New England cover crops, and strategies of utilizing cover crops on commercial vegetable farms with an emphasis of fitting cover crops into seasonal vegetable crop rotations.

On February 20, 2014, staff organized a workshop on Storage Facility Engineering for Winter Vegetables in Windsor, CT, with 19 farmers. The workshop was conducted in conjunction with Connecticut University Extension and Ruth Hazzard of U Mass Extension. The workshop included a dual presentation by a UMass Building Engineering faculty member and graduate student on constructing and monitoring the efficiency of a "Free-Air" winter storage device to utilize outside air when temperatures dropped below 32 degrees to reduce energy costs for a conventional cooler compressor. Farmers gave presentations on heating winter squash from vented heat from a storage-carrot cooler compressor + designing and building a tandem 3-chamber wet and dry earth-bermed winter vegetable storage facility. A member of the Hartford office of the FSA provided information for beginning farmer loans to construct or improve winter storage facilities for root crops, cabbage and winter squash.

On February 27th, staff organized a workshop on Design Features for Greenhouses and High Tunnels with 22 farmer participants in Vernon, CT. The workshop focused on scaling up for Beginning Farmers through Engineering Structural Integrity into High Tunnels & Greenhouses as well as evaluating energy efficiency for greenhouse heating systems. A former UConn Agricultural Engineer did a presentation on the weaknesses of greenhouse and high tunnel frames and how to improve their structural integrity to withstand extreme weather events. He also provided information on the energy efficiency values of different heating systems and greenhouse/high tunnel covers. Two guest farmers did presentations on construction tips for greenhouses and high tunnels following their own experiences with collapsed structures after extreme snow and wind events. Their presentations included discussion of their utilization of high tunnels for the production of winter salad greens. A representative of the Hartford County NRCS provided information on EQIP matching grants for high tunnel purchase and construction.

On March 1, 2014, staff conducted a workshop as part of the Connecticut NOFA Winter Conference for 29 farmers in Danbury, CT. Staff presented a Power Point talk on green manure covers crops and served on an afternoon panel representing CT-NOFA's mentor-journey person program.

Technical Assistance

Technical assistance includes instruction regarding seed varieties, succession plantings, and the influence of seasons on succession changes, harvest quality (how to pick quickly and efficiently), washing, drying, packaging, and pricing. Also, we introduced the concept of forming a "community of growers" and linking them to other growers on our incubator farm sites in a cooperative way to have volume of specialty crops needed to sell at target markets, and in order to move surpluses (targeting the highest value possible). We discussed the importance of crop *quality* which is particularly important for specialty crops which should have higher value (disease mgmt., pest mgmt., nutrient mgmt.) to realize value potential of those specialty crops. We discussed the importance of production systems. With regards to tomatoes, we have a production system which links harvest efficiencies with managing disease and managing insects. We introduced sustainable systems including development of harvest aisles containing legumes (cover crops) for sustainability, tomato stakes with basket weave technique, to allow for quicker harvest and less disease. We discussed market strategies for harvesting including making distinction for ripeness, influenced by who you are marketing to. With regards to pea tendrils, we discussed how to distinguish quality crops. For greens, we also discussed the importance of timing of harvest activities, vented plastic bags for extending quality post-harvest, and spin drying of greens. Growers looking to expand production of salad greens were urged to purchase a used washing machine for improving the efficiency and speed of spin drying greens. Two of our incubator farmers in Newburyport purchased a used washing machine for this purpose.

In December 2012, staff provided 4.5 hours of one-on-one technical assistance to graduated farmers. Subjects covered included recordkeeping for specialty crops in advance of FSA for loan application meeting; assistance with crop bidding application and preparation of financial survey for specialty crops and business plan update documents. In January 2013, staff spent 16 hours providing one-on-one TA to assist farmers with completion of marketing agreements and farm financial surveys for specialty crops, and assisting farmers to develop their plans for the upcoming season. Staff spent 22 hours in February, 17 hours in March, 29 hours in April and 1.5 hours in May 2013, assisting with development of farm financials and completion of the World PEAS marketing agreement, and in obtaining required insurance coverage. One-on-one marketing technical assistance was provided to farmers growing specialty crops in the field for a total of 39 hours in June, 29 hours in July, 21 hours in August, and 31 hours in September 2013. An additional 18 hours was spent during the first year grant period by New Entry's CSA Coordinator providing TA around packaging, and quality control of specialty crops delivered by New Entry farmers to the World PEAS Food Hub.

The following one-on-one support was provided to New Entry farmers around specialty crop production in 2014: October 2013 – 3.6 hours; November 2013 – 4.3; December 2013 – 5.5; January 2014 – 6.4; February 2014 – 2.7; April 2014 11.5; May 2014 – 14.8; June 2014 15.4; July 2014 18.7; August 2014 – 10.4; September 2014 10 hours.

New Entry staff assisted three farmers at the Newburyport incubator farm site (one originally from Turkey). Staff recommended that field peas and oats be used as a test cover crop to seed a 1/4 acre of fallow land, so that the farmers could take advantage of the resulting pea tendril cash crop when ready for harvest. This crop was successfully harvested, and an additional ¼ acre was seeded with oats and field peas. Again the New Entry farmers were successful in harvesting and the result was an increase in $2K of revenue for these farmers from the two plots. The land owner of this site observed this activity, and chooses to cover crop an additional 2.25 acres at the site (not being leased to the New Entry farmers). In the spring, he will provide access to the New Entry farmers for harvest of these pea tendrils. This concept, introduced by New Entry staff, was tested, then expanded, adopted by the landowner, and further expanded to benefit the incubator farmers at that site. In 2014 an incubator grower in Dracut as well as a new incubator grower in Newburyport are utilizing pea tendril "tips" to add weight and "nuance" to their salad mixes. They are also using the purple pea flowers of the distinct seed varieties planted at our incubator sites to distinguish their salad mixes from other growers.

At the New Entry incubator farm sites in Dracut, a total of 1.5 acres were seeded with field pea and oat cover crop, for harvest by New Entry farmers, a new specialty "greens" crop not tested prior to this project.

Beginning in September 2012, New Entry staff provided and installed plastic cover on the incubator site greenhouse for two incubator site farmers in preparation for them to extend their production of specialty crops beginning in early spring 2014. Salad greens were planted in early October of 2013 and harvested during the last 2 weeks of November and first 2 weeks of December 2013. Another flush of baby greens was harvested in late March when the greens broke dormancy in early spring, 2014. Tomatoes were planted in our high tunnel in May of 2014, trellised via the basket-weave practice and is still being harvested at the date of this grant report (extending by more than 7 weeks what growers were able to do "in field.")

One on one TA was central to providing individual education to our client farmers. We wanted to show how specialty crops could fit into a well-conceived whole farm plan. This plan includes field production, marketing, and post-harvest handling. We were able to show our growers how to time the planting and harvesting of specialty crops throughout the entire 12 month year. We also showed how to utilize space both in field as well as in our incubator farm high tunnel. We emphasized the importance of quality both while harvesting as well as protecting the harvests postharvest. Our new cooler/wash area facility was a crucial infrastructure improvement to illustrate how important such facilities are for high value specialty crops.

Resources The New Entry free agricultural library has over 400 publications (books and CD's) available to loan, covering production, marketing, whole farm planning, food safety, post harvest handling, specialty crops and other topics. These books and CD's are available at the Lowell office, located at 155 Merrimack Street, Third Floor, and Lowell, MA. A summary of each library publication is posted to the New Entry website, in order to promote utilization of this important resource. To view the resources listed, visit: http://nesfp.org/farmer-training/library

In addition to the hard-copy resources posted to our site, there multiple publications available covering production and marketing topics for specialty crops, including topics such as "Tomato Care", "Vegetable Flash Cards", "Vegetable Identification", "Plain Language Guide to Good

Agricultural Practices", "Spreadsheet on how to Plant Vegetables", "Lettuce, Salad Mix, Scallions and Cilantro", and many other specialty crop guides.

b.) If the outcomes measured are long term, summarize the progress that has been made toward their achievement.
The outcomes measured were short-term outcomes (noted below).

c.) A comparison of actual accomplishments with the goals established for the grant period

For this project, New Entry tracked production and sales figures for 22 beginning, immigrant and minority farmers who produced specialty crops for area farmers markets and the New Entry-sponsored World PEAS CSA (compared to a goal of 30 farmers). In 2013, New Entry staff conducted 9 workshops (with a goal of 8) and provided 210 hours of hands-on technical assistance. In 2014, New Entry staff conducted an additional 12 workshops and provided 103 hours of hands-on technical assistance specific to specialty crops. In addition, in 2013 we provided training to an estimated 285 beginning farmers via our seasonal field training workshops and winter conference workshops (compared to a goal of 80 farmers). In 2014, we provided training to an estimated additional 195 beginning farmers via state-wide conference workshops. We provided online resources accessed by 123 unique individuals from Sept. 14, 2013 – Oct. 13, 2013, and 1,400 unique individuals accessed our on-line resources during the period 10/14/2013 – 9/30/2014 per Google Analytics for the New Entry website that launched in September 2013 (compared to a goal of 100+).

d.) Illustration of baseline data that has been gathered to date and the progress towards achieving set targets

Baseline Data Earnings among our program farmers through the Food Hub averaged $4,429 in 2012, a 17 % increase from 2011. However, depending on years of experience, time available to dedicate to farming, and to a smaller extent, acreage, the individual farmer earnings do vary significantly. Two specialty crop farmers, with several years of experience farming with World PEAS, earned over $10,000 through sales to World PEAS in 2012, while many of the more recent graduates of the Farm Business Planning Class earned within the $1,500-$5,000 range. By the year 2014, five New Entry farmers had revenues in excess of $10,000, and more recent Farm Business Planning Class graduates earned within the $800 - $10,000 range. Baseline 2012 statistics compared to 2013 and 2014 statistics are noted below:

Farmer #	2012 WPC Sales	2013 WPC Sales	2014 WPC Sales	% Change in Sales 2012 - 2014	Status
1	**$3,555**	**$3,400**	**NA**	**NA**	**Began in 2010. Moved farm to Maine in 2013.**
2	**$2,739**	**$3,789**	**$3,944**	**+44%**	**Began in 2011. Moved to independent land in 2014**
3	**$6,180**	**$8,416**	**$9,371**	**+52%**	**Began in 2009.**

4	**$380**	**$8,517**	**$16,827**	**+4,328%**	**Began in 2003. Moved to independent land in 2013**
5	**$4,669**	**$5,021**	**NA**	**NA**	**Began in 2011 (incubator site). Took a break in 2014 to successfully negotiate purchase of independent farmland.**
6	**$2,996**	**$6,549**	**NA**	**NA**	**Took break from farming in 2014 to return to school**
7	**$12,821**	**$12,753**	**$15,213**	**+19%**	**Began in 2003**
8	**$6,965**	**$6,935**	**$9,117**	**+31%**	**Began in 2006**
9	**$7,331**	**$7,178**	**$11,938**	**+63%**	**Began in 2003**
10	**$6,621**	**$5,231**	**NA**	**NA**	**Began in 2008. Took a break from farming in 2014 due to personal financial issue.**
11	**$10,768**	**$5,216**	**NA**	**NA**	**Began in 2007. Farmer returned to his homeland (Cambodia) in 2013**
12	**$5,226**	**$5,766**	**$12,645**	**+142%**	**Began in 2003. Moved to new land in 2013.**
13	**NA**	**$1,158**	**NA**	**NA**	**Began in 2013. Decided to pursue gardening after unsuccessful first year.**
14	**NA**	**$1,326**	**$834**	**+100%**	**Began in 2013 (incubator site)**
15	**NA**	**$2,687**	**$3,186**	**+100%**	**Began in 2013 (incubator site)**
16	**NA**	**$2,649**	**$4,083**	**+100%**	**Began in 2013 (incubator site)**
17	**NA**	**$4,424**	**$8,498**	**+100%**	**Began in 2013 (incubator site)**
18	**NA**	**$4,006**	**$7,936**	**+100%**	**Began in 2013 (incubator site)**
19	**NA**	**$8,939**	**NA**	**NA**	**Began in 2013. Took a break in 2014 due to death in family**
20	**NA**	**$7.033**	**$10,049**	**+100%**	**Began in 2013 (incubator site)**
21	**NA**	**$2,566**	**$2,646**	**+100%**	**Began in 2009. Had baby in 2011/2012.**
22	**NA**	**$3,429**	**$5,939**	**+100%**	**Began in 2007. Unable to farm in 2011/2012.**

a) Summarize the major successful outcomes of the project in quantifiable terms

New Entry small scale and limited resource farmers are dependent on income from specialty crops to meet the needs of their families. From 2012 to 2014, there was a 28% overall increase in farmer earnings by New Entry farmers for specialty crops tracked from a population of 28 World PEAS growers each year. Farmer revenues increased for 13 out of 19 specialty crops produced:

	WPC 2012	**WPC 2014**	**Difference**

Pea Tendrils	$543	$3,459	$2,916
Amaranth	$1,110	$2,051	$941
Sweet potatoes Greens	$480	$541	$61
Mustard Greens	$2,300	$3,824	$1,524
Water Spinach	$797	$1,756	$959
Kale	$3,872	$5,378	$1,506
Collard Greens	$3,598	$1,337	-$2,261
Chard, Swiss	$3,011	$3,312	$301
Bok Choy, Tatsoi, Spey, Pak Choy, Komatsuna	$3,300	$4,314	$1,014
Spinach	$0	$1,256	$1,256
Lettuce	$3,110	$8,618	$5,508
Arugula	$5,293	$4,456	-$837
Baby salad greens	$1,357	$3,141	$1,784
Spinach, baby	$1,470	$665	-$805
Tomatillos	$1,075	$1,837	$762
Tomatoes, Cherry	$5,077	$7,790	$2,713
Tomatoes, Heirloom	$7,207	$5,130	-$2,077
Tomatoes, Slicing	$8,084	$7,783	-$301
Lemon Grass	$1,493	$1,180	-$313
Total	$53,177	$67,828	$14,651

e.) Beneficiaries (including the following information)

- **a.** A description of the groups and other operations that benefited from the completion of this project's accomplishments
- **b.** State the number of beneficiaries affect by the project's accomplishments and / or potential economic impact of the project.

A total of 35 New Entry farmers benefitted from in-depth training, technical assistance, and new educational resources during the course of this project, and 475 beginning farmers benefited from our state-wide conference workshops. As a result of this project, farmers earned an additional $14,651 in revenues from sales of specialty crops.

New Entry participants include a wider range of beginning farmers, including interns and apprentices, transitioning farm workers, career changers, retirees, and many other individuals across a diverse socioeconomic and cultural spectrum. As the program as grown and expanded, New Entry continues to maintain an emphasis on inclusion of socially disadvantaged immigrant and refugee populations. During the grant period, New Entry worked closely to provide training and technical assistance services to other new refugee incubator participants, including the International Institute of New England with offices in Lowell and Southern New Hampshire. These immigrants and refugees from tropical climates have significant growing experience, yet need more intensive assistance with the fundamentals of New England agriculture: timing of planting and harvest dates; watering and pest management; help finding (legal) seed sources;

storing harvested crops; and accessing good markets where they would receive a fair price for their bounty. With scarce English language and literacy skills, many of the farmers have struggled to navigate their new cultural communities and marketplace. Production acumen is just one component of a comprehensive skill set needed to succeed with a small farm enterprise. To address this, New Entry's focus has been on a market-oriented approach to addresses all elements of farm enterprise from seed sourcing to product sale.

In addition, a total of 500 families around the Boston area, including low-income families, benefited from access to fresh, local specialty crops grown by New Entry farmers. An additional 1,000+ individuals benefitted from access to fresh fruits and vegetables via World PEAS other markets, including low-income seniors, low-income children, homeless individuals, and low-income mothers.

c. Illustration of the lessons learned as a result of completing this project

Fundamental to this project was the teaching of how specialty crops can be grown and harvested with good planning throughout the year. We were able to demonstrate that even fallowed fields, planted to green manure cover crops could yield good income utilizing distinct seed varieties of field peas that could be sold as a "specialty greens" product to chefs and other direct markets. We also illustrated how the creative use of space, both in field as well as in high tunnels could provide opportunities for dense plantings of different cash crop families with an understanding of crop placement and timing. Also integral to the teaching of growing specialty crops was post-harvest washing, cooling, and packaging. We enhanced both wash areas at our incubator farm training sites and centrally placed our cooler to illustrate how to site farm infrastructure for efficient movement of crops throughout the post harvest cycle.

Accounting of expenses showing amount of grant funds expended on the project

Personnel	$20,408
Fringe	$7,476
Travel	$373
Supply	$1,488
Conference Costs	$255
Total	$30,000

Purple edible blossom from select field pea seed variety.

Incubator farmer demonstrating good weed management and dense direct-row seeding of salad greens.

Incubator farm new cooler and wash area demonstrating close access of wash area to post-harvest cooler.

Post-harvest packing of cilantro inside new cooler during hot summer night (cool packing space protects quality).

Incubator growers, Muthu Arumugam, shows fellow incubator farmer, Nasrin Morovaty and CSA member his specialty crop of Indian red amaranth.

Incubator grower Steve Fowler walking past field pea fallow, also utilized as a high value specialty crop (2nd year utilizing this practice)

Overwintered high tunnel salad greens ready to harvest March 12, 2014.

Demonstration of incubator high tunnel area utilizing multiple cropping, staggered sequencing of spring transplants (radicchio for spring harvest; tomatoes for summer/fall harvest).

Demonstration in incubator farmer plot, multiple cropping/special techniques as utilized by different specialty crops: straw mulch for wide-spaced transplants, basket-weave trellising for tomatoes utilizing both plastic and straw mulch; Remay cloth to protect baby turnips from flea beetles; living straw mulch of oats and red clover to serve as green manure harvest aisle for tomatoes.

2nd flush of field pea tendrils in September 2014, grown by letting May seeding go to seed and germinate again for 2nd fallow crop.

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www.nesfp.org

Organization: Nuestras Raices

Project Title: The Increasing Sales of Massachusetts-Grown Specialty Crops in Low-Income, Immigrant, and Refugee Communities Project

FY 2012 12-25-B-1467

Final Report:

1) A Project Summary consisting of the following information:

a) Background of the initial purpose of the project, including the specific issue, problem or needs that were addressed by the project;

Nuestras Raices assists immigrant and refugee farmers to begin sales at farmers markets. These growers produce specialty crops exclusively and need technical assistance to overcome language and cultural barriers to restrict markets for their products. This project has increase sales of Massachusetts–grown specialty crops while also addressing the nutritional and educational needs of the state's low–income families, including immigrants and refugees. This Project has also enabled the immigrant and refugee farmers involved in this project to collect and process their own WIC, and senior coupons that previously could not due to language barriers.

b) Description of the importance and timeliness of the project;

The beneficiaries of this project are the specialty crop producers as well as the Holyoke community, which now has increased access to locally grown specialty crops in our low-income communities. The significant increased use of public benefits has demonstrated a great need for projects like this, to increase the availability of local specialty crops in low-income communities.

c) If the project built upon a project that previously received Specialty Crop Block Grant, describe how the project complemented and enhanced previously completed work.

This project builds on Nuestras Raices' 2010 *Tierra de Oportunidades* specialty crops project. *Tierra de Oportunidades* provided technical assistance to new immigrant farmers so they could sell at farmers' markets and a multi-lingual marketing initiative to promote farmers markets in immigrant communities. The project also pilot tested the use of double WIC, EBT, and elder coupons in Holyoke Farmer's markets. Key learning from *Tierra de Oportunidades.* This project has

benefited *Tierra de Oportunidades* by allocating more resources for record keeping. Also while building robust partnerships to increase public benefit use at farmer's markets to increase sale of specialty crops.

2. The Project Approach (including the following information):

a) A brief summary of activities performed and goals and /or targets achieved throughout the entire grant period. This should represent the activities/ goals and targets specified in Attachment B: Work Plan;

October 1, 2012 –September 30, 2013

- Jesus Espinosa met with WIC to coordinate and begin the project; received a permit for the Donahue market; invited 5 vendors to participate in the Donahue market alongside Nuestras Raices farmers; mentored 10 farmers to sell at the Holyoke Market; supported WIC with taste testing materials; coordinated with WIC office to design recipe cards and get them printed.
- Cynthia Espinosa supported beginning farmers in receiving technical assistance to enter the farmer's market and create business plans; prepared marketing materials for the farmers markets; mentored farmers on how to track their sales; kept a log of trainings and mentoring activities with farmers
- Hilda Roque-Colon supervised the farm staff in administering the program
- Kendy Capois worked internally with Jesus Espinosa and the farm staff to track the farmer's market sales, cash flow, check requests and reimbursements.
- Thomas Trepanier mentored new farmer's to enter the farmer's market for the first time. He also coordinated the Donahue farmer's market along with Nuestras Raices staff on a rotating schedule.
- Felix Machuca took over the farmer's market and mentoring duties when Jesus Espinosa went on medical leave in August and Cynthia Espinosa left in July; collected the coupons at the end of each market on Thursdays at the Holyoke market and on Saturdays at the Donahue School market; coordinated the Donahue market on a rotating schedule with other Nuestras Raices staff after Jesus Espinosa's departure; supported the WIC staff with materials for their taste tests.
- Diego Angarita designed a web-based record keeping program through CTK Apricot to track coupon sales and project outcomes; coordinated the Donahue market along with other Nuestras Raices staff on a rotating schedule; supervised the farm staff in administering the project; and did the grant reporting
- Karen Grossi helped to design a more efficient petty cash system of purchasing from the Nuestras Raices farmers to sell at the Donahue market; coordinated the printing of the marketing materials; coordinated the Donahue market during the month of October; supported the WIC staff in taste testing at the Donahue market with materials
- WIC staff developed recipes that promoted specialty crops; designed recipes to use seasonal Massachusetts grown produce; did cooking demonstrations at the farmer's market with movable feast; did tastes testing at the Donahue market; coordinated with NR staff to capture data and monitor outcomes.
- The taste testing occurred on June 20, July 25, July 27, August 22, August 24, September 26, September 28, and October 12. Each cooking demonstration used a different recipe

that highlighted and promoted Massachusetts grown specialty crops. The dishes included Strawberry and Rhubarb Crisp, Green Salad, Black Bean Salsa, Jalapeno and Lime Coleslaw, and Sofrito. The specialty crops were specifically planned to highlight specialty crops that were available at the market and in season for attendees to be more inclined to purchase products that they were less familiar with.

- The Kids Incentive Coupons began on June 20th and continued throughout the summer until all the coupons had been distributed through the WIC program. Coupons redeemed were tracked as farmers turned in the used coupons to a Nuestras Raices staff member. The Administrative Assistant tracked and processed payments for the farmer's.

October 1, 2013 - September 30, 2014

- Kendy Capois and Felix Machuca processed all WIC coupons used at the Holyoke farmers market and Donahue Farmers market; Processes all senior coupons and WIC checks receive from Nuestras Raices Farmers; Internally Collected and compiled data for reporting.
- Purchased signage to increase awareness of specialty crops and farmers markets
- Thomas Trepanier Provided technical assistance to Nuestras Raices farmers; Hosted WIC redemption training presented by David Webber of the Massachusetts Department of Agriculture, at the Nuestras Raices main office for local farmers.

b) If the project benefited commodities other than specialty crops, indicate how the Contractor ensured that grant funds were used only to enhance the competitiveness of specialty crops;

There were no other commodities other than specialty crops involved with this project.

c) A summary of the contributions and roles of project partners.

The Project partners are WIC staff and participants, Nuestras Raices staff and members, Holyoke Food and Fitness Policy Council, the City of Holyoke, and Lutheran Social Services. The WIC Program designed recipes, provided tastes tests, cooking demonstrations, and a follow up WIC redemption training. Nuestras Raices mentored farmers, tracked sales data, coordinated vendor relationships, and marketed the farmer's markets. Holyoke food and fitness provided financial support to cover cost that could not be covered through Specialty Crops. The City of Holyoke provided the coordination of the Thursday downtown farmer's market, granted space for the cooking demonstrations and tastes test as well as tracked sales information.

3. Goals and Outcomes Achieved (including the following information)

a) A description of the activities that were completed in order to achieve the performance goals and measureable outcomes indentified in Attachment B;
Work Completed
September 2012 –April 2013

- Nuestras Raices, WIC, Holyoke Food and Fitness Policy Council, and the City of Holyoke met to coordinate and begin project.

- Nuestras Raices Program staff worked with beginning migrant, immigrant, and refugee farmers in Hampden County to prepare them to sell at farmers markets.
- WIC developed marketing materials and prepared for market season.

May-October 2013

- WIC held monthly events at Holyoke Farmer's markets and distributed Kid's Incentive coupons
- Nuestras Raices provided technical assistance to new market vendors
- Nuestras Raices and WIC collected data throughout market season
- Nuestras Raices refined market data throughout season
- WIC revised recipes to cater to Specialty Crop requirements for reimbursement
- Nuestras Raices creates new internal project team to manage with staff turnover

November, 2013-October 2014

- End of season data collected and summarized
- Adjusted budget to better serve the needs of program
- Hosted WIC redemption training
- Improved signage
- Final reporting

b) If the outcomes measured are long term, summarize the progress that has been made toward their achievement;

The outcomes measured are long term in that this project has provided information on nutrition, and preparation of specialty crops to community members as well a fed the already established demand for specialty crops while simultaneously increasing it. The vendors/farmers are now processing their own WIC and senior coupons and have acquired knowhow in proven methods to market their specialty crops.

c) A comparison of actual accomplishments with the goals established for the grant period;

Goals/Target Reached Throughout Grant Period

- The first objective of increasing WIC, SNAP, and senior voucher sales by 10-15% was developed using the baseline data that the organization collects each year in collaboration with the City of Holyoke. Based on our internal sales data from the Nuestras Raices farmers and additional market vendors. We successfully achieved our outcomes during the duration of the project. WIC vouchers redemption at the Holyoke farmers market increased 47.26% from 2012 to 2013. EBT usage increased 83.7% from 2012 to 2013. Senior voucher usage increased 16.03% from 2012 to 2013. The greatest gainer we saw was in the Fruit and Veggie Prescription Coupons, which increased 154% from 2011 to 2013.
- The second objective to increase availability of ethnic specialty crops through assisting and mentoring 3-5 immigrant and refugee farmers to sell at farmers markets for the first time was developed on baseline programmatic data that Nuestras Raices has tracked through the Beginning Farmers Training Program. We surpassed this goal and mentored 10 beginning low-income immigrant and refugee farmers to enter the Holyoke Farmer's Market, including 3 farmers who started farming for the first time in 2013. For the 2014

season 6 out of the 10 Nuestras Raices farmers returned and continue to sell specialty crops at the Holyoke and Nuestras Raices farmers markets.

d) Illustration of baseline data that has been gathered to date and the progress towards achieving set targets.

All public benefit baseline data is collected every year in collaboration with the City of Holyoke and is based on internal sales data from the Nuestras Raices farmers and redeemed WIC, and senior Coupons from the farmers markets.

- WIC vouchers – redemption has increase 81.63% since 2011 and had increased 47.26% since 2012
- EBT usage – has increased 296.8% since 2011 and has increased 83.63% since 2012
- Senior Voucher – Redemption has increase 48.04% since 2011 and has increased 16.03% since 2012
- Fruit and Veggie Prescription coupons- has increase 154% since 2011

All the baseline data collected to evaluate the need and base to get 3-5 farmers to sell at farmers markets for the first time was collected from data tracked in the Nuestras Raices Beginning Farmers Training Program. We mentored 10 beginning farmers, including 3 farmers who started farming for the first time 2012. Of the 10 farmers mentored 6 are now attending farmers markets on their own with technical assistance provided as needed.

4. Summarize the major successful outcomes of the project in quantifiable terms4) Beneficiaries (including the following information)

a) A description of the groups and other operations that benefited from the completion of this project's accomplishments;

The groups that benefited from this project are the Farmers market vendors, who experience increase sales through increase usage of public benefits at the farmers markets. Nuestras Raices was able to compliment the training for farmers involved in the Beginning Farmers Training Program, by providing information and knowhow on public benefit redemption, how to access farmers markets, and several methods of marketing.

The Holyoke community has benefited with improved access to specialty crops as well as information on preparation of certain food items that they may have not been familiar with.

b) State the number of beneficiaries affected by the project's accomplishments and / or potential economic impact of the project.

This project has increased sales and public benefit redemption for 32 vendors including the 10 Nuestras Raices farmers. While also benefiting an estimated 300-500 costumers per week attending the farmers market by in increasing the availability of specialty crops in Holyoke Massachusetts.

We believe that sales and public benefits use for specialty crops will only increase in the years to come and this project was a major stepping-stone in that direction. Nuestras will continue to work closely with the City of Holyoke and the Holyoke farmers markets in increasing consumption of local grown specialty crops.

5. Illustration of the lessons learned as a result of completing this project.

What we have learned here at Nuestras Raices is that there is a demand for specialty crops in Holyoke Massachusetts that has not been met. Whether it is due to price, location, availability of certain produce, or product information. People want to eat healthy locally grown food. Overall this project was well received and we managed to accomplish most of the activities and goals originally proposed.

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Project Title: The Holyoke Kindergarten Initiative (HKI): Healthy, Local Nutrition for a New Generation

FY 2012 12-25-B-1467

Final Report

PROJECT SUMMARY

Healthy family nutrition featuring a wide variety of fruits and vegetables is too often a scarce commodity in the city of Holyoke, MA. Holyoke is one of the poorest cities in the state, yet it is located in the bountiful Pioneer Valley agricultural heart of the Commonwealth. The children in Holyoke live in an urban environment where quality fresh fruits and vegetables can be hard to find close to home; at the same time, the rise of urban agriculture provides exciting new channels to bring fresh specialty crops into Holyoke. The challenge for advocates of family nutrition and local farms is to create a demand for local produce – for our specialty crops – while increasing the supply of Mass-grown fruits and vegetables available in the school and for the family dinner table. The Holyoke Kindergarten Initiative (HKI) has proven to be an excellent mechanism to expand the markets for specialty crops by using local foods to educate young students about healthy nutrition and where our food comes from. The HKI also informed students' families about specialty crops as parents attended farm field trips, cooking demonstrations, and received healthy take-home local food packages as part of the Initiative. We feel the HKI successfully addressed the challenge of raising awareness of local specialty crops for Holyoke families,

helping to increase consumption of healthy produce, and creating demand for our specialty crops.

The HKI was important and timely because Holyoke children and families remain largely isolated from the benefits of the exploding local food revolution across the Pioneer Valley. Advocates of healthy specialty crops have both an educational and food preference curve to overcome in order to widely increase the consumption of fresh produce in Holyoke. The HKI was an excellent program to begin to overcome these challenges.

The original grant award for the Holyoke Health Center SCBGP award for the 2012-2013 school year had some funds remaining as of the end of the grant term. The term of the grant was extended by one year to allow extra time to complete the work and spend the remaining budget in an approved fashion. The extension was approved in writing, as per USDA requirements, with the Mass. Department of Agricultural Resources. This report addresses the programs, challenges, and successes of the HKI over the entire term of the grant. The schools and classrooms hosting the HKI remained the same over the two school years, so the 2013-2014 work is clearly built upon the 2012-2013 program.

PROJECT APPROACH:

The activities and tasks performed during the period of this grant run from October 1, 2012 through November 2014 due to the extension granted for rollover funds into 2014.

Teacher Education

During the 2012-2013 school year a lot of time was spent getting to know the teachers and principals participating in the HKI. Holyoke's food service provider, Sodexo, does not preferentially purchase local specialty crops in the cafeterias so there was little farm to school awareness in the district. Teachers and principals first attended a half-day orientation at City Hall learning about local farming, field trips, nutritional concepts like "sometimes" and "any time" foods included in the HKI curriculum, and the benefits of specialty crops. Many of our teachers do not have "green thumbs" so even adults had a lot to learn about healthy, local produce.

Twice during the 2012-2013 school year 10 teachers and 1 of 3 principles received continuing education from Debi Hogan's excellent team at Massachusetts Agriculture in the Classroom. Educators learned about basic plant science in the first session, and later in the year participated in a workshop on the use and benefits of herbs. In both sessions teachers learned quite a lot, again indicating that the horticultural understanding of the HKI teachers was not terribly strong, so in order to help promote specialty crops we had to teach the teachers some plant basics.

During the 2013-2014 school year the HKI Coordinator met with the 10 teachers during the fall to review the Initiative including the plant science and local farm education so teachers were ready for this farm to school program in their classrooms.

A component of the teacher workshops included gathering feedback on the HKI curriculum, which was well-received and reviewed by all educators. The curriculum is an excellent tool to

educate students on fresh foods and local farming and consistently supports the consumption of healthy specialty crops. We were pleased – and a bit surprised – to receive no negative feedback on the curriculum!

Taste Tests and Specialty Crops Samples

Food remains an amazing tool to bring people together, to foster dialogues and learning, and to appreciate new tastes and recipes. Throughout the HKI students, teachers and families sampled a wide variety of specialty crops. Twice-weekly specialty crop in-classroom samples were provided to all students in the 10 HKI classrooms (250 participants). Teachers used the snacks to educate kindergarteners while they enjoyed their specialty crop samples. Over one school year thousands of specialty crop samples were enjoyed in the HKI classrooms – 30 weeks x 250 students x 2 samples per week = 15,000 samples!

Exposing parents and siblings to local specialty crops is an important component of the HKI. Four local food take-home packages were provided to families between 2012 and 2014. Three packages came from the farm field trips (apples twice, pumpkins and squash), and two packages from local specialty crop farms (Equinox Farm, Nuestras Raices and Fairlane Farm) included root crops, winter greens, and Massachusetts cranberries. Take-home packages included recipes in Spanish and English and teachers reported an enthusiastic overall response. However, further one-on-one conversations with at least 5 parents were not terribly enthusiastic about the root crops in particular – beets were not a hit. Some of the local winter greens were not enjoyed either as we learned from the students that families threw out the produce. This is in line with our expectations: the Holyoke Hispanic community generally only uses only iceberg lettuce for salads.

Based on feedback from parents, teachers and students it is clear that fruit is strongly preferred within this community over fresh vegetables. Responses were over-the-top enthusiastic to local apple samples by all ages. And, kindergarteners regularly consumed all of their weekly fruit samples in the classroom, while more of the vegetable samples were thrown away. Culturally this fits with food preferences within our Hispanic community; specialty crops are almost always cooked with some kind of meat or sausage, and whole unprocessed fruit consumption is higher, reflective of the dietary content in Puerto Rico, Central and South America, and across the West Indian Latino populations.

Finally families were asked to attend one major cooking demonstration event in the spring of 2014. A healthy hot oatmeal breakfast with specialty crop mix-ins was served to HKI students and parents. At one school over 50 parents attended the breakfast, and helped their children add dried cranberries, fresh local strawberries, dried apricots, honey and even a drop of fresh maple syrup into their oatmeal. The response to the breakfast was excellent with the one caveat that parents tended to resist allowing the kindergarteners to make their own choices. Students were overheard telling their parents, “Let me do it. This is ‘any time’ food so it’s okay to eat strawberries. Let me mix my own food.” This is common in our community; parents do not generally encourage independent learning when it comes to family nutrition. The cooking demo was held for 250 students, and approximately 85 parents and caregivers in three schools.

Farm Field Trips and School Gardens: Hands in the Dirt, Little Feet in the Fields

Students and caregivers attended four farm field trips as part of the Holyoke Kindergarten Initiative, to two apple orchards, to a pumpkin farm, and to watch sugaring off in late winter. 250 students, 91 parents, and 20 teachers and aides attended the field trips which were – without question – the most popular and educative component of the Holyoke Kindergarten Initiative. Farm field trips promote specialty crops in the most direct, delicious, and easy-to-understand fashion of any program component. Holyoke is not well-forested, nor is there a lot of open land. For many families this was the first time on a local farm, and parents were almost universally enthusiastic about visiting these farms again. It is an opportunity for a family to learn, eat good food, get exercise and enjoy the outdoors. However, urban parents were not all pleased with the field trips and we received 3 reports of parents who did not like that their children's clothes and shoes were muddy after the field trips.

The pumpkin farm field trip was not as successful because the farmer does not allow the specialty crop to be harvested by visitors. Instead, small pumpkins were pre-picked and scattered around a field. The students enjoyed running around the field and trying to grab the biggest of the little pumpkins, but there was no connection to the earth, the plant, or learning how pumpkins grow and ripen on vines. This was disappointing and we would not encourage more HKI trips to this farm site.

The sugaring off field trip was a huge hit. Students tasted sap out of the trees, looked for trees with tubing or buckets attached, and marveled at the warm and steamy sugar house. As a specialty crop, maple syrup is a great local product but it is not as nutritious as the fresh produce provided through the program. So, maple syrup was agreed to be "sometimes" food by the students and teachers.

School garden work with our partner School Sprouts was a moderate success. At one school the garden was well-established and had a little spare space specifically for kindergarteners. However at two other schools the gardens were smaller and did not easily accommodate a space for one grade level only. All students spent time in their school gardens looking in the fall at the plants still alive with some harvest yet to come (winter squash, some winter greens and herbs). Kindergarteners assisted putting the gardens to "sleep" for the winter in a minor fashion. During the school day it is hard to coordinate hands-on garden work for so many students during a 30 minute session. However, the school with the well-established garden did allow kinders to plant early season greens in March/April which were available for a little harvest and classroom salad. The school garden component is difficult to add to the HKI, and in subsequent years this component has faded.

Focus on Specialty Crops

Throughout the HKI we were very careful to promote healthy specialty crops over other commodities. The concept of making healthy choices, and that produce is "any time" food is central to the Initiative. We did hold a local cheese taste test that was not paid for by SCBGP funds, which was a single 2-hour event within a full year curriculum focusing on local farming and healthy produce.

Project Partner Contributions

The Holyoke Public Schools have been wonderfully supportive of the Kindergarten Initiative and have agreed to expand the program to all kindergarten classrooms run by HPS. HPS administration has experienced a lot of turnover, however, so the original supporters are no longer on staff. We have had to rebuild relationships with the new team, but the HPS has been very collaborative. HPS' contribution was allowing access to the classrooms, adding an HKI curriculum, and providing access to facilities as needed.

Fertile Ground, our evaluator, remains a terrific program partner. Students, teachers, principals and parents were surveyed, and we learned a lot from the evaluation component. Because of their strong farm to school background and support of the Worcester Kindergarten Initiative Fertile Ground was up to speed immediately helping define and measure the impact of the HKI in Holyoke.

School Sprouts, our school gardening partner was a moderately effective component. As was referenced above, school gardens are designed for many grades and not just for one age range or group of classrooms. School Sprouts remains the primary liaison for HPS to support school gardening and their work is fine. However, committing school garden resources to the kindergartners alone was not terribly successful.

Massachusetts Agriculture in the Classroom provided two teacher training sessions on basic plant sciences and use and cultivation of herbs. Debi Hogan and her team are real heroes, and patiently explained fundamental plant biology to the teachers who were not all attentive and interested students. The herb session was more successful as it was sensory and tactile, and included cooking and eating discussions. This component served to educate teachers who did not know much about farming and gardening personally.

Seeds of Solidarity Education Center provided the initial teacher training in fall 2012. Dr. Deb Habib informed teachers about local agriculture, different farming practices (organic vs. conventional, till vs. no-till et al), and why certain crops grow well in Massachusetts. Dr. Habib also skillfully raised teacher awareness regarding nutrition and specialty crops, such as how to recognize healthy basics like eating a rainbow of colors in your produce. The HKI curriculum was reviewed, and we value Dr. Habib's role in initial teacher training.

Nuestras Raices proved to be a valuable local partner, providing one of the healthy produce take-home sample packs for families, and supplying discount coupons to their farm store for HKI families. We held a draw-a-farm contest in spring 2013 with the winners receiving half-shares of the Nuestras Raices specialty crop summer CSA. The culturally-preferred produce grown by Nuestras Raices is an important learning tool that connects healthy produce with deep and important cultural traditions in our local Hispanic community.

The City of Holyoke played a minor supportive role. The public schools were initially concerned about classroom vermin if foods were to be served outside the cafeteria. The Board of Health helped us define "Clean in the Classroom" standards for proper waste disposal and clean up after specialty crop tastes and samples were served.

GOALS AND OUTCOMES ACHIEVED

Activities Completed to Achieve Performance Goals and EMOs

GOAL: Increase HKI kindergarteners' understanding of "sometimes" and "any time" foods, awareness of locally grown specialty crops, and to correctly identify whether produce is a fruit or a vegetable.

ACTIVITIES TO SUPPORT THIS GOAL: Classroom curriculum specifically developed for the HKI used weekly focused on farming, how plants grow, fruits vs. vegetables, and basic nutritional concepts like making healthy choices. Field trips to area farms demonstrated process to grow and utilize specialty crops first-hand, with apple orchards and sugar shack visits being the most informative. In-class specialty crop tastes helped students learn to name and enjoy a variety of fruits and vegetables.

OUTCOMES: Students easily learned the concept of "sometimes" and "any time" foods after they were told it's not about what you prefer to eat, that the goal is to identify healthy choices. 61% of students in the post-intervention evaluation surveys successfully identified sometimes vs any time foods, compared with 33% initially. One school was surveyed in 3 classrooms. Initially 12% of students understood the concept of locally-grown foods, but only 20% learned this after the program. Kindergarteners have a difficult time understanding that local means close by, and you can get to this farm from your home. Travel and time and distance are not easily understood by 5 and 6 year-olds. Results identifying fruits vs vegetables were better, and the teachers attributed this to the weekly in-class specialty crop samples: one sample/week was a vegetable, and the second sample/week was a fruit. Initial baseline data was 24% understood these definitions before the HKI, and 42% after.

ASSESSMENT: The critical concept of identifying healthy choices was a success, and specialty crops are an excellent tool to teach this idea. The concept of local produce is probably beyond the reach of most kindergarteners, particularly in Holyoke where families move a lot between (specifically) Puerto Rico and the United States, and when families do not have cars it is difficult to convey that locally-grown is a car-ride away. Differentiating fruits and vegetables was a reasonable success and our goals were achieved. We expect long-term results will most be realized in the area of "sometimes" versus "any time" food choices because kids quickly grasped that produce is always a healthy choice.

GOAL: Facilitate local specialty crop purchases by Sodexo for the HPS school cafeterias, using the example of the HKI to demonstrate that local specialty crop farms can sell successfully and safely to the public schools.

ACTIVITIES TO SUPPORT THIS GOAL: The Sodexo staff at HPS were informed about all local food purchases and assisted by providing refrigeration space and access to the school kitchens for HKI-related events. The Sodexo staff was informed about local farm to school options, including regulation 30B which allows for no-bid purchases of local produce by Massachusetts K-12 public schools. Options for preferential purchasing of local specialty crops were reviewed with local and regional Sodexo staff and senior management. Local specialty crop samples for the HKI were also given to Sodexo staff, using food to cultivate interest and raise awareness in local specialty crops.

OUTCOMES: This EMO was a complete failure and was removed as an EMO for the 2013-2014 HKI school year. Sodexo refuses to source produce directly from any local specialty crop farm, even if that grower possesses $5 million in liability insurance, is GAP certified and has HACCP certification. Only produce provided by "approved vendors" is allowed for purchase, which is monopolized by the Sodexo relationship with Fresh Point in Hartford. Food safety concerns were continually referenced, but practically this is an invented problem. Many tons of local produce are served in Massachusetts schools without incident, from well-insured and educated farmers. Finally, Sodexo regional management did agree to meet, but stonewalled by never providing the information as to how a farmer becomes an approved vendor. This aspect of the HKI was very disappointing and it is a shame that Holyoke cannot participate in the full and vibrant farm to school efforts statewide that provide healthy specialty crops to the school menus.

ASSESSMENT: Having been stonewalled in our efforts to bring local specialty crops to the Holyoke school cafeterias we are even more committed to programs like the Holyoke Kindergarten Initiative, which so successfully uses local specialty crops to encourage a lifetime of healthy eating and support of local farms. The Sodexo contract was renewed for an additional three years in spring 2014. Farm to school efforts in Holyoke occur 100% outside the realm of the cafeterias, so keeping these programs alive is tremendously important to increasing awareness of local specialty crops in our area.

GOAL: Use the Holyoke Kindergarten Initiative to Promote Specialty Crops to Families

ACTIVITIES TO SUPPORT THIS GOAL: The activities used to support these goals are parental inclusion on farm field trips (4 field trips), healthy cooking demonstrations in the school cafeterias (1 event), and take-home specialty crop produce samples (6 times, 4 field trip take homes plus 2 additional sample packs), and the draw-a-farm contest which included specialty crop rewards from Holyoke's Nuestras Raices farm.

OUTCOMES: The number of parents who attended the farm field trips was excellent, with 91 parents acting as field trip chaperones. Anecdotally the parents particularly enjoyed the apple orchard which was unfamiliar to many parents who migrated/immigrated to Holyoke from West Indian Hispanic countries or territories. Program coordinators encouraged parents to cook new dishes with the farm produce, including apple sauce, baked apples, squash pies, steamed and seasoned squash, and substitute northern crops like butternut squash in traditional Hispanic dishes like calabaza squash stew. The healthy cooking demonstration was attended by 85 parents and caregivers across three schools, with parents reporting that they didn't know their children enjoyed such a variety of specialty crop fruits like cranberries or other dried fruits. All HKI families received a $2 farmer's market discount coupon for the Nuestras Raices farmers at the Holyoke Farmers Markets, but only $22 of these coupons were redeemed. 3 families received free half-shares of the Nuestras Raices CSA, and 6 families received discount coupons for the Nuestras Raices farm store. Because Holyoke residents don't all have cars only 45% of these produce awards were redeemed. Parents who attended HKI events were surveyed to determine their awareness of local farming and specialty crops. A total of 104 surveys were administered via a quick "dot survey" verbal questionnaire. 62% of parents said they would like to visit a farm again, 44% were excited to visit a local farmers market, but only 12% of parents had actually been to a Holyoke farmers market or local farm stand. Overall some parents were well-informed about local specialty crop farmers and their products, with those parents who

attended HKI events being clearly more involved and interested in this component of their child's education.

ASSESSMENT: The parents who were involved with the HKI were receptive to increased consumption and education on locally-grown specialty crops and specialty crop farms, and the same parent populations were seen at these events. Holyoke parents are pretty pressed for resources and time. A large number of female-run households in the city mean Mom has more than one job and cannot easily visit the school during her work day. Teachers also explained that about 1/3 of all students are disadvantaged either because their English is weak/non-existent and/or their families are transient and will only spend partial school years living in one place. However, all parents surveyed want healthy food for their children even though only 25-33% remain at their current addresses and can attend the HKI events. Because of the high rates of obesity, diabetes and heart disease in the Holyoke Hispanic community programs that increase awareness and consumption of healthy produce remain critically important to local public health. Minds and palates are changed one at a time, and we have had good successes in a difficult population.

BENFICIARIES

Students: 500 kindergarten students were impacted by the Holyoke Kindergarten Initiative during the two school years supported by this funding. Each student received intense and repeated exposure to the concepts of specialty crop farming through field trips, taste tests and produce sample packs, and via the HKI in-classroom curriculum.

Parents: 500 households received written information in English and in Spanish sent home in backpacks about the Holyoke Kindergarten Initiative. We are comfortable stating that at least 150 parents attended the field trips and cooking demonstration; some were repeat visitors.

Teachers, Aides, Administrators: 27 Holyoke Public School employees participated in the Holyoke Kindergarten Initiative in some capacity. We believe the teachers were most dramatically impacted, which was supported by 100% of teachers asking that the HKI continue running into the future.

Farmers: 12 Massachusetts farms benefitted from the HKI. 4 hosted field trips, and the remaining farmers sold specialty crop produce that was used to support the HKI events and sample packs. The HKI provided direct economic benefit to local specialty crop farms.

Stakeholders and Partners: Our collaborating partners (listed above) actively participated in this farm to school program, and learned firsthand how healthy, local specialty crops can be a critical learning and nutrition education tool in underserved communities.

LESSONS LEARNED

The Kindergarten Initiative came to the Holyoke Public Schools after Holyoke Food and Fitness Policy Council members learned about the program's success in the Worcester Public Schools. From this we learned that a good program has a track record, and that the careful and bureaucratic K-12 school district environment wants to see proof that a program works before

introducing it in their classrooms. We were incredibly lucky to partner with a great team in the Holyoke Public School administration, who opened doors allowing us access to school facilities and support services for billing, curriculum and procurement. Each urban district has its own unique character, and Holyoke was a great spot to launch the KI in a second Massachusetts gateway city.

Logistically the program is complex to administer. There are a lot of details required with billing, paperwork, farm food deliveries, and getting various HKI materials home to the parents. The Initiative is probably too heavy in terms of staff support, which makes it difficult to sustain. To that end, expanding the HKI to all Holyoke kindergarten classrooms has meant redefining our projects to keep them achievable and repeatable. For example, sorting and sending home sample produce packs for so many families is really time intensive when the packs contain multiple products from multiple specialty crop farms.

It is crystal clear that Holyoke families are not terribly well-informed with regard to household nutrition and how to cook and enjoy specialty crops. This was unexpected. The HKI was a great way to teach adults – parents and teachers in particular – about these concepts without insulting their lack of knowledge. It was also apparent that parents and teachers were learning alongside the kindergarteners. We feel the HKI is a subtle but effective way to teach adults under the guise of informing kinders about healthy nutrition and specialty crop farming.

We learned that in a school district that does not support any preferential purchasing local specialty crops in the cafeteria that keeping other farm to school programs running is critically important to deliver the message that local produce is available and affordable, and to use food as a powerful learning tool. The Holyoke Kindergarten Initiative is the only in-classroom agriculture and nutrition education program running in the entire district. Without the KI the Holyoke Public Schools fall even further behind similar districts in Massachusetts.

Finally, we learned that quality project partners make a huge difference in the outcome of the program. Not all partners were easy to reach, and some had complex scheduling concerns. We know now to simplify the relationships with project partners because working with an urban school district will always be complex! We don't need more moving parts to this program, and in fact time and resources are stretched when organizing a program across so many entities – partners, staff, schools, administrators, farmers, and funders are all involved so we will continue to favor simplicity and efficiency in order to keep the HKI running and successful in Holyoke.

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Project Title: Supporting Specialty Crops through Better Process Control School and Value-Added Production

FY 2012 12-25-B-1467

Final Report

1) A Project Summary:

a) Background

Producing healthy, convenient and safe value-added processed foods is a way to further extend specialty crops throughout the year and provide new product offerings to consumers. However, in order to produce safe, quality foods, there are a variety of core food safety principals that need to be identified and controlled when processing. Through the support of the MDAR Specialty Crop Block grant, UMASS Food Science Extension invited specialty crop farmers that are interested in producing value-added products to participate in a 3.5 day course, "Better Process Control School" to learn the key food safety processing fundamentals specific to commercial canning operations.

By law, all commercial processors, when first engaging in the manufacturing, processing, or packing of low acid or acidified foods in any state they must register with the FDA on Form FDA 2541 (Food Canning Establishment Registration; 21 CFR 108.25, http://extension.psu.edu/food-safety). In order to be approved as a registered process, companies need to operate with a certified supervisor on the premise when processing.

Better Process Control School offers instruction which fulfills the FDA and USDA Good Manufacturing Practice requirements to certify supervisors of acidification, thermal processing and container closure evaluation operations during the canning of low-acid or acidified foods. Throughout the course six basic topics are covered with an examination at the end of each session. Participants that complete the full exam and score a minimum of 70 receive a passing score is acknowledged through a certificate.

This course is offered throughout the United States, however, prior to 2013, the closest course offerings in New England is Orono, ME and Geneva, NY. In effort to make this course more accessible to Massachusetts food producers/processors, UMass Food Science introduced this course in January 2013. UMASS Extension elected to host this event in January to include the specialty crop farming community to participate in this class so it would not interfere with the planting and harvest season. The BPCS course is targeted to food processors but through the support of this grant, we were able to encourage participation of MA specialty crop farmers to participate through a scholarship to facilitate identifying new ways to further expand their business pertaining to specialty crops. ***The primary goal of this project is to increase the food safety processing skills for farmers interested in producing value-added specialty crops (examples include: acidified foods, glass container closures, retorting, etc.).***

b) Description of the importance and timeliness of the project

While there is significant demand for local produce in the northeast region, the agricultural production season is limited in terms of growing days. Furthermore, the region has been experiencing increased incidence of severe and unpredictably intense weather events. Therefore it is imperative that new season extension strategies and responsive harvest and processing models are identified to provide local product offerings throughout the year. It is equally important to provide appropriate technical support to be regulatory compliant for small and medium size farming. Offering the proper educational tools to farmers makes the specialty crops more competitive as it makes the specialty fruits and vegetables more readily available to consumers throughout the year. Buying local continues to be a growing movement within Massachusetts. Identifying new value-added products helps to expand the overall usage for specialty crops.

The intended beneficiaries of this project were specialty crop farmers that are looking to expand their business through value-added processed foods. UMASS Extension hosted BPCS course for the past three years in January. Over the course of this time, we invited eligible farmers that were interested in value-added processing to participate at a discounted rate through an MDAR scholarship program.

c) If the project built upon a project that previously received Specialty Crop Block Grant, describe how the project complemented and enhanced previously completed work

This project did not build on previously received Specialty Crop Block Grand funding.

2) The Project Approach:

a) Summary of Activities:

The list of project activities and progress is noted in Table 1. Details of the project findings are reported in Section 2.c.

Table 1 Summary of Activities

Project Task	Measurable Outcome	Date of Completion	Project Notes/Progress
Establish Benchmark Data	Conduct assessment with interested farming participants *(year 1, assessment 1)*	November 2012	Task completed during the recruitment of farming participants.
Recruit farmers to participate	Identify 10 farmer participants	December 2012	Recruitment resulted in 5 participants.
Develop and implement course material for BPCS	Prepare all necessary materials for course work and manage	December 2012	Task completed.

	operational logistics.		
Complete BPCS course	Conduct training course & monitor certification success rate (students need a minimum of 70% in order to receive certification)	January 2013	Task completed. 4 out of 5 farmer participants successfully completed the course. 1 participant dropped out during the middle of the course.
Post course completion assessment	Monitor farmers intentions of farmers post BPCS *(year 1, assessment 2)*	January 2013	Task completed. 4 out of 4 farmers completed the post course assessment. Analysis will be reported upon completion of final report.
8-month post course assessment	Monitor farmers progress in preparing to produce value-added specialty crop products *(year 1, assessment 3)*	September 2013	Task completed. 3 out of 4 farmers completed the post course 8 month assessment. Analysis will be reported upon completion of final report.
Recruit farmers to participate	Identify 10 interested farmers	November 2013	Recruitment resulted in 5 participants.
Establish Benchmark Data	Conduct assessment with interested farming participants *(year 2, assessment 1)*	December 2013	Task completed during the recruitment of farming participants.
Develop and implement course material for BPCS	Prepare all necessary materials for course work and manage operational logistics.	December 2013	Task completed.
Complete BPCS course	Conduct training course & monitor certification success rate (students need a minimum of 70% in order to receive certification)	January 2014	Task completed.
Post course completion assessment	Monitor farmers intentions of farmers post BPCS *(year 2, assessment 2)*	January 2014	Task completed.
8-month post course assessment	Monitor farmers progress in preparing to produce value-	September 2014	Task completed. 3 out of 7 farmers completed the post course 8 month

	added specialty crop products *(year 2, assessment 3)*		assessment. Analysis will be reported upon completion of final report.
Conduct 20-month assessment	Monitor farmers progress in preparing to produce value-added specialty crop products (year 1, assessment 4)	September 2014	Task completed. 2 out of 5 farmers completed the post course 20 month assessments. Participants were emailed 3 times, called twice and sent survey to encourage participation.
Recruit farmers to participate	Identify 10 interested farmers	November 2014	Recruitment resulted in 4 participants.
Establish Benchmark Data	Conduct assessment with interested farming participants (year 3, assessment 1)	December 2014	Task completed during the recruitment of farming participants.
Develop and implement course material for BPCS	Prepare all necessary materials for course work and manage operational logistics.	December 2014	Task completed.
Complete BPCS course	Conduct training course & monitor certification success rate (students need a minimum of 70% in order to receive certification)	January 2015	Task completed.
Post course completion assessment	Monitor farmers intentions of farmers post BPCS (year 3, assessment 2)	January 2015	Task completed.
8-month post course assessment	Monitor farmers progress in preparing to produce value-added specialty crop products *(year 3, assessment 3)*	September 2015	Task completed. 2 out of 4 farmers completed the post course 8-month assessment.
Conduct 20-month assessment	Monitor farmers progress in preparing to produce value-added specialty crop products (year 2, assessment 4)	September 2015	Task completed. 1 out of 7 farmers completed the post course 20-month assessment.

b) If the project benefited commodities other than specialty crops, indicate how the Contractor ensured that grant funds were used only to enhance the competitiveness of specialty crops

This is not applicable as all of the participants that attended the BPCS use specialty crops for their value-added products.

c) A summary of the contributions and roles of project partners.

The overall BPCS program covered six basic food safety processing topics over 18 Chapters in 3.5 days. The topics included: 1) Microbiology of Thermal Processed Foods, 2) Food Container Handling, 3) Records, for Product Protection, 4) Food Plant Sanitation, 5) Principles of Thermal Processing, 6) Process Room Instrumentation. Throughout the course, participants required to successfully pass an exam for each course topic. A minimum score of a 70% for each course topic is required to receive certification. The examination questions are prepared by the Food Processors Institute with approval of the FDA and USDA.

The PI, Amanda Kinchla, UMASS Extension Specialist managed the overall project activities (Course material, course facilities, assessment administration and reporting). She designed and implemented an assessment tool to monitor the program success through the support of William Miller, Center of Agriculture Extension, Director of Planning and Assessment. The program curriculum was supported by additional collaborating partners Dr. Lynne McLandsborough, Dr. Sam Nugen, Dr. Julie Goddard and FDA Food Specialists [Doug Joslin (year 1 & 2) and Tom Nerney (year 3)].

Over the three year period of the grant we had 16 specialty crop growers successfully complete the program (93.8% success rate). All of the participants successfully completed the course program and received certification that is recognized as an approved training for canned goods (21 CFR 113 and 114: http://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfcfr/CFRSearch.cfm?CFRPart=113&showFR=1).

3) Goals and Outcomes Achieved (including the following information)

a) Performance goals and measureable outcomes

Currently, there is a lack of data that shows the proportion of Western Massachusetts farmers who are engaged in producing value-added products from specialty crops or the quantities that growers produce and sell. Our assessment strategy focused on documenting the success of the proposed project and we initiated a data collection process that helped to establish some regional benchmarks in this area.

Goal: The intended outcome of this project was to increase the number of farmers who are successful in producing safe, value-added products using specialty crops.

Performance Measures: To monitor progress towards this outcome, we will assess participant's level of interest, knowledge and skills for producing value-added products using specialty crops. We will also assess the degree to which participants have translated knowledge or skills into practices that reflect progress or success in producing value-added products using specialty crops.

Benchmarks: Data will be collected that will establish baselines for program participants as well contribute to the creation of regional benchmarks for a broader sample of Western Massachusetts growers. Baselines and benchmarks will reflect growers' current specialty crop volume, product portfolio (including any value-added products) as well as their interest, intentions and skills related to producing value-added products from specialty crops.

Target: Ninety percent of participants will increase their knowledge and skills for producing safe, value-added products from specialty crops. At least 50% of participants will implement practices that reflect progress or success in producing safe, value-added products using specialty crops.

Reflecting on our overall goals and outcomes we were able to increase the number of farmers who are successful in producing safe, value-added products using specialty crops. The 93.8% certification rate helps to indicate that farmer participants were able to increase their knowledge in food safety. In addition, we had requested the participants self-report their production capacity before and after taking the course (Table 4). This data suggests that farmers were able to utilize their knowledge to produce safety, value-added products to expand their use of specialty crops.

b) If the outcomes measured are long term, summarize the progress that has been made toward their achievement

The intended outcome of this project was to increase the number of farmers to successfully produce safe, value-added products using specialty crops. This project did not directly measure a long term goal. However, the post-assessment tools indicate that this course helped specialty crop farmer's gain additional knowledge specific to value-added (canning) food safety practices (Table 3 and 4).

c) Actual accomplishments

Table 2: Participation Reporting

Project Year	Goal Participation (and certification)	Actual accomplishment
2013	10	6
2014	10	7
2015	10	4

Based on the feedback from the local farming communities and the rising interest of extending farmers markets throughout the year, we anticipated a larger participation interest (i.e. 10 participants). The BPCS scholarship program yielded lower participation than projected. Corrective actions were taken to promote recruitment for participation by partnering with other entities to help communicate the scholarship opportunity for farmers looking to commercialize value-added products made from specialty crops. Examples: Scholarship announcements were distributed through additional partners, such as MA Specialty Processors, Farm Bureau, and

Community Involved in Sustaining Agriculture (CISA), Franklin County Community Development Center, Commonwealth Kitchen, Southeastern Massachusetts Agricultural Partnership (SEMAP), and the Massachusetts Department of Agriculture.

While this program did not yield as many participants as expected, those that did participate found the program significantly valuable in preparing them for processing canned good products to increase the production of their specialty crops. In addition, including the farming community to our program, we were able to identify new programming that can better cater to the specialty crop community. Specifically, we learned that one attributing factor that may have limited participation is awareness. Many new value-added processors were not familiar to the food safety parameters and/or regulations pertaining to value added processing and therefore did not know that current food regulation require operator training for canned foods. Therefore, the UMass Food Science Program developed new extension programming that focuses more generally about food safety and product development consideration for new food processors. This program was piloted in November 2014 and has since been fielded in two locations in New England. This programming has had over 60 participants and many of the attendees included were specialty crop growers.

d) Illustration of baseline data that has been gathered to date and the progress towards achieving set targets

Table 3 Preliminary Assessment from farmer's interest in pursuing value added products

Survey Questions	**Pre**	**Post**	**8m**	**18m**
How many years have you been farming?	2-34 years Ave: 7.5 years	2-34 years Ave: 8.1 years	5-13years Ave: 7.5 years	4-30years Ave: 13 years
How many acres do you farmed?	1-150 acres Ave: 36 acres	1-150 acres Ave: 35 acres	1-150 acres Ave: 35 acres	1-50 acres Ave: 26 acres
Are you value-added processing now?				
YES	64.3%	61.5%	62.5%	66.7%
NO	35.7%	38.5%	37.5%	33.3%
How interested are you in producing and selling value added processing NEXT SEASON?	4.5 ± 1.1	4.9 ± 0.3	4.9 ± 0.4	4.3 ± 1.2
Rate your current level of the skills needed for producing value added products from MA specialty crops?	3.0 ± 0.8	4.0 ± 0.8	4.6± 0.5	4.0 ± 1.0
What is your current knowledge of the status rules and regulations pertaining to the production	2.5 ± 1.0	4.1 ± 1.1	4.0 ± 1.3	3.7 ± 1.5

and sale of VAP from specialty crops?				
How confident are you that you will begin producing and selling VAP from MA specialty crops in the next growing season?	4.2 ± 1.2	4.4 ± 1.1	4.0 ± 1.5	3.7 ± 2.3
NOTE: Ratings used for the ranking questions were based on a Likert scale from 1 to 5. No skill/ knowledge/interest; 5: Very skilled/knowledgeable/interested. Data was averaged using the collective data across all of the assessment years.				

e) Summarize the major successful outcomes of the project in quantifiable terms

This program has provided food safety knowledge relevant to operators interested in processing shelf stable canned food products. Participants that attended this course significantly increased their knowledge in food processing and have been able to retain this knowledge as shown in Table 3. Furthermore, participants have self-reported their volume of value-added products. Data reported in Table 4 compares volume production of value added products reported before attending the course and after attending the course. Overall, there is a significant volume of production increase from participants that have attended this course. Results show a 260% increase in production volumes in canning production from participating farms. In addition it is worth noting that one farmer reported that they did not sell any products prior to the course. However, they have now developed several products that are in position to be sold (reported as sales samples).

Table 4 Reported estimated values of value added products produced by growers

Product Type	**Reported at Pre-Assessment**	**Reported post assessments**
Tomato Juice	3,000 pounds	None
Canned products Includes jelly, jam, pickled products, relishes	3,200 pounds	8,325pounds
Frozen produce	1,000 pounds	500 pounds
Sales samples (in development) Salsa, dilly beans, and other	n/a	176 pounds
Other growers listed the types of products that they are interested in processing but did not indicate the production volumes. Products of interest include: chutney, cider, pickles, relish, sauce and salsas.		

4) Beneficiaries

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

The intended beneficiaries of this project were specialty crop farmers that were looking to expand their business through value-added processed foods. All participants were prescreened to ensure that they met these criteria during a scholarship application process. This particular program has not only supported the production of specialty crops it has provided food safety education specifically to value added production. All of the participants indicated significant increase in a variety of food science topics based on the curriculum of Better Process Control School.

Additional, this program exposed growers to a wider network of people involved with food production. During this program we had a diverse array of participants including academics, food manufacturers, product developers, regulator specialists and producers. Enabling this community of participants to interact fostered an excellent network that has helped build future collaboration opportunities.

In fact, one grower stated, "We are (now) in the process of building a commercial kitchen onto our farm stand so that we can produce these products. We are also investigating regional kitchens to be sure that processing pickles and relish in our kitchen is the best option for our farm. Knowledge, understanding and contacts that I acquired in the Better Process Control School have greatly helped us through this process. We have also added a food safety component to our training for all farm staff and feel that we are in a better position to explain the biological reasons and consequences behind the ruled. Thank you Amanda, et al."

b) State the number of beneficiaries affect by the project's accomplishments and / or potential economic impact of the project.

We had a total of 16 participants successfully complete this program (93.8% success rate) and receive certification.

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Project Title:

Enhancing Farmer Capacity to Produce High Quality Hops for the Local Brewing Industry

Organization: University of Vermont

FY 2012 12-25-B-1467

Final Report

1) Project Summary

The goal of this project was to increase the quantity and quality of hop production in the Northeast through locally relevant research and outreach programs. The specific objectives of this proposal were to identify hop varieties that are appropriate for this region and to develop proper harvesting and post-harvest strategies to improve the yield and quality of locally grown hops.

The craft brewing industry is growing ever stronger in the United States. Massachusetts and Vermont are home to nearly 100 craft breweries Craft brewers are always looking for an edge, for something new and unique. With the continued popularity of the localvore movement, brewers want to source their ingredients locally. An expansion both in interest and production of hops in New England has been spurred by brewer demand. However there is very little information on how to grow hops in our region. Hops are primarily grown in the Pacific Northwest a climate that is far different than ours. Since 2009, UVM Extension has been working to develop regionally relevant production and processing information on hops. The ultimate impact is for farmers to be able to produce an economically viable crop in our region.

The outcome from this project was to see a measurable improvement in hop yield and quality on hop farms in the region. Through this work we expected a 25% increase in yield and a 50% increase in quality of at least 20 hop growers in the region.

As of the end of this project there were more than 350 acres of hops in the Northeast (NE) with hop yards ranging in size from 0.25 to 25 acres. These farms are increasing their hop acreage and new growers continually enter the scene. Growers in the NE do not have the decades of experience growing hops that can be found in the west. Developing relevant research and outreach will provide growers with tools that can help them overcome the risks of growing a new crop. The rapid expansion of this crop has also brought a rapid demand for information and training on how best to grow hops. Hence the SCBG funds focused on hop production over the last 5 years has been critical to building the core set of information that current and new growers are relying on to assure success of this fledgling industry.

Several Specialty Crop Block Grants (SCBG) have been received to initiate the hops research and outreach program at UVM. The first grant was to establish the research hopyard and develop outreach materials focused on starting a hopyard. The project goal was to begin developing varietal and other agronomic recommendations for the region by conducting a variety evaluation trial. Much was learned from that first year of data collection and subsequent years of funding from the SCBG as well as other grants have helped develop regionally relevant hop growing information.

A second SCBG was awarded to help current and future hop growers evaluate economic viability of hop production models. Under the four scenarios outlined by Rosalie J. Wilson in her report entitled "Feasibility and Market Research Study For Commercial Hops Production in New England", an economic analysis funded by the SCBGP, it was determined that at a price point of $15/lb for pelletized local hops, it is possible to net $12,910 per acre. The demand for local hops is so high that brewers are paying up to $25/lb for whole leaf dried hops, making the return on investment significantly shorter than that projected by Wilson.

As farmers began planting hops it became evident that hand harvesting would not be a viable option especially when the production exceeded an acre in size. Through a third SCBG funds were used to develop a small-scale mobile hop harvester that would be viable for the region. The harvester was developed and has since been replicated by farms in at least 6 states and 2 countries. In addition, the design was modified and assisted a commercial hop harvester fabrication business with launching its first small-scale harvester. The hop harvester design and instructional videos have been accessed by thousands of interested stakeholders.

Hops are a high-value crop, but there is still much research that needs to be done to determine fertility requirements of a maturing hopyard, varietal selection over time, Northeastern pest pressures and beneficial arthropod interactions, and proper post-harvest handling techniques. The goal of the current SCBG was to continue hop research and outreach development in the NE to help farmers improve yields and quality.

2 Project Approach

The UVM Extension hops program was started in 2010 to develop agronomic recommendations for hop production in the Northeast. The region has changed agriculturally and advancements in crop production have occurred since hops were grown in this area in the 1800s, with many new varieties released and a better understanding of cropping science. During the 2013 and 2014 season, the UVM Extension Hops Program focused on increasing hop yield and quality through research and outreach. Research projects included continued evaluation of hop varieties, development of disease and weed control strategies, and surveys to identify prevalent hop pests for the region. Research results were compiled into reports, blogs, videos, and factsheets and delivered to the stakeholders through a variety of outreach mechanisms.

Research results were presented at the 11 conferences and field days. Our Winter Hops Conference has hosted speakers from Washington, Oregon, Colorado, Michigan, Wisconsin, Maryland, New York, and Maine. Key topics included fertility, irrigation, pest management (insects, diseases, and weeds), solar hop drying, and the impact of cover crops, irrigation,

harvesting, drying, and packaging. Information delivered in the 44 "What's Hoppening" blog posts during this project included links to research reports, upcoming events and announcements including new hop videos and the opening of our UVM lab hop quality analysis. The "What's Hoppening" blog can be accessed here and the YouTube channel can be accessed here. The Vermont Hop Project is a page on the Northwest Crops and Soils website where annual hop reports, bulletins, factsheets, and online education tools can be found.

Below is a summary of activities and results developed in 2013 and 2014 through the SCBG titled "Enhancing Farmer Capacity to Produce High Quality Hops for the Local Brewing Industry". The outcome from this project was to see a measurable improvement in hop yield and quality on hop farms in the region. Through this work we expected a 25% increase in yield and a 50% increase in quality of at least 20 hop growers in the region.

HOP RESEARCH

This SCBG captured the results of the 3rd and 4th year of production for the hop varieties and hence they are now considered mature plants. The goal of the research projects reported here was to evaluate 24 commercial hop varieties for pests, yield, and quality under NE climatic conditions. Results are presented for 2013 and 2014 field season data.

General research hop yard materials and methods:

The replicated research plots were located at Borderview Research Farm in Alburgh, VT on a Benson rocky silt loam. The experimental design was a randomized complete block with three replicates; treatments were varieties. The hopyard was constructed in the spring of 2010 using 20' x 6" larch, tamarack, and cedar posts, with a finished height of 16'. Aircraft cable (5/16") was used for trellis wires. A complete list of materials and videos on the construction of the UVM Extension hop yard can be found at www.uvm.edu/extension/cropsoil/hops.

Four foot wide hop beds were tilled with a moldboard plow, tilled again with a 3-point hitch, 4' rotary tiller, and then planted with two vegetative hop cuttings per hill on 4-Aug 2010. Hills were distanced 7' apart, and rows were spaced at 10'. Each plot consisted of five consecutive hills. Hardwood mulch application was the primary weed control method, and as the weeds were brought under control, rows were trained with two strings of coir (coconut fiber) per hill, with three to four of the strongest bines trained per string. At training, hills were fertilized and then mulched with hardwood mulch. All fertilizers and pesticides were OMRI-approved for use in organic systems, and were applied at rates recommended in the Pacific Northwest.

Project 1: Crowning as a downy mildew management tool:

Methods: Crowning treatments to control downy mildew were mapped out and flagged in the research hopyard. Crowning was conducted on 2 different dates this spring. There were 3 replicates of 3 treatments on each of two varieties (Cascade and Nugget). Treatments included: early crowned April 14, 2014, late crowned May12th, 2014, and not crowned (control). These plots were all crowned on the same date in 2013.

Results: Our preliminary data suggested that plants crowned on the earliest date, April 14, 2014, exhibited the highest incidence of aerial downy mildew spikes but those plants also had the lowest number of infected cones at harvest. Downy mildew damage to the hop cones is the final indicator to determine if crowning can reduce downy mildew in hops. The hop harvest occurred in late August, where yields were recorded by treatment and 100 cones from each plot were assessed for incidence of downy mildew. Results indicate that crowing treatments did not negatively impact hop yield compared to no crowning. Hop cone downy mildew severity did not differ significantly by treatment. This indicates that crowning may have little impact on full season control of downy mildew (Figure 1, Table 1).

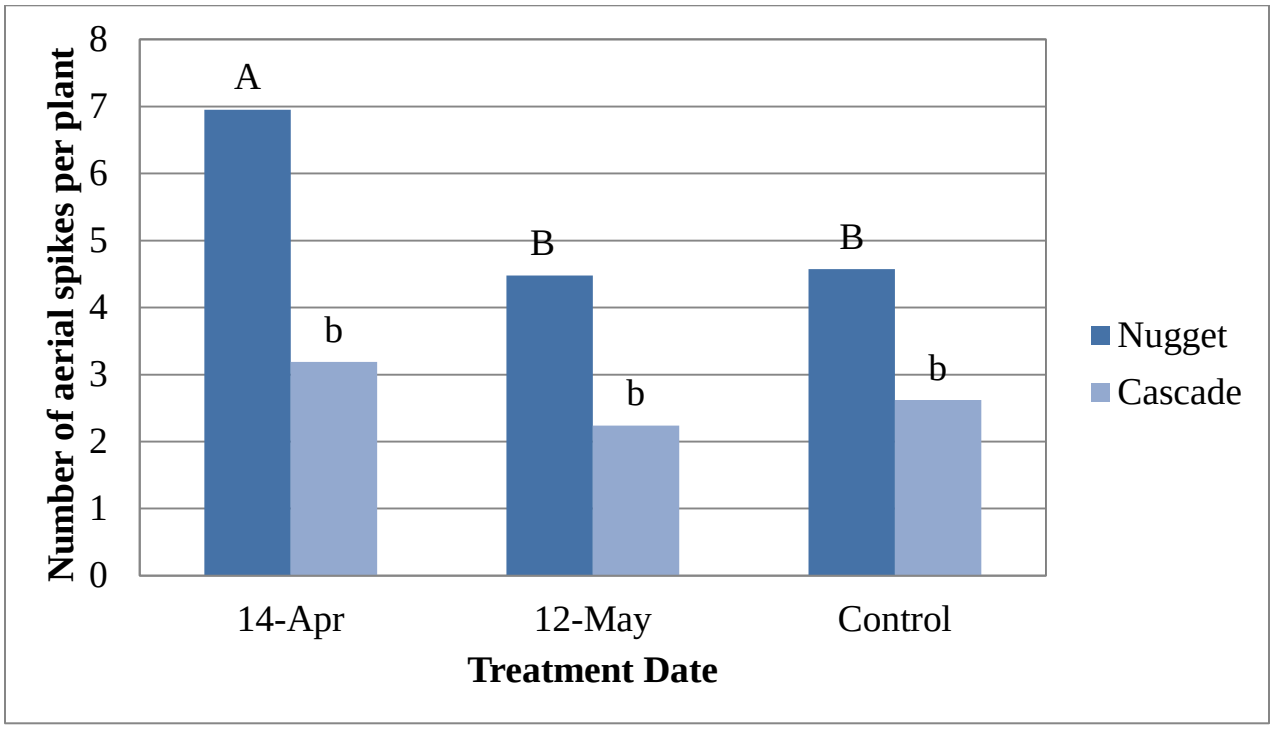

Figure 1: *Average number of downy mildew aerial spikes per plant in three crowning trial treatments, Alburgh, VT, Mid-July 2014. Treatments with the same letter are not significantly different from each other.*

Table 1: *Yield and quality performance across crowning treatments in 2014.*

Crowning Date	Alpha acids	Beta acids	HSI	Yield @ 8% moisture	100 cone weight	Cones with downy mildew	Browning severity
	%	%		lbs ac^{-1}		per 100	Out of 10
14-Apr	**12.0**	**7.85**	0.24	**868**	17.1*	**33.7**	3.83
12-May	11.8	6.94	0.24	788	14.8	37.8	4.17
Control	10.9	6.78	**0.23**	790	**17.1***	34.7	**3.67**
LSD	NS	NS	NS	NS	1.1	NS	NS
Trial mean	11.7	7.24	0.24	816	16.3	35.4	3.89

LSD – Least significant difference

NS = Not significantly different

* Treatments indicated with an asterisk did not perform significantly worse than the top-performing treatment in a particular column.

Project 2: Evaluation of cultural and mechanical weed control strategies:

Methods: Four weed control strategies were implemented in our organic research hop yard in 2014. Treatments included tillage, organic herbicide (citric acid), steam weeding, and mulch. The treatments were applied to the plant row (not drive row) in early June following training and pruning. All treatments were replicated 3 times. Each treatment had 3 hop hills and measured 3 x 20 feet in size.

Results: In 2104, herbicide and mulch provided the best weed control. These treatments resulted in 50% less weed biomass compared to steam and tillage treatments (Figure 3). The weed control treatments did not significantly impact hop yield indicating that weed pressure was low enough to minimize competition with the crop. Hence we would assume that all treatments were effective in reducing weed pressure to minimize crop loss.

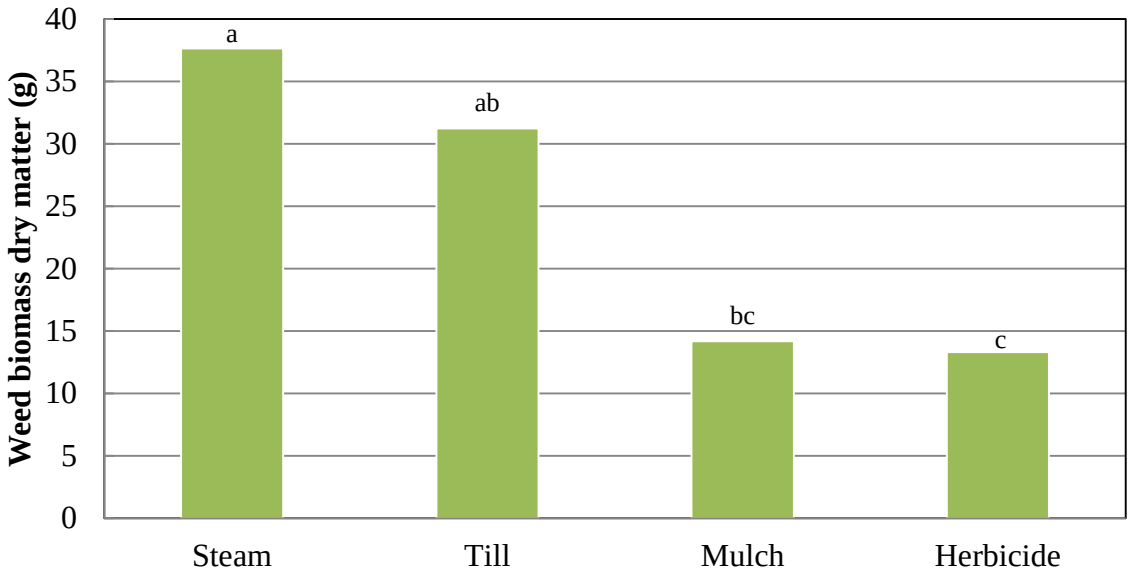

Figure 3: *Weed biomass in hop rows that were treated with different weed management strategies in 2014. Treatments with the same letter are not significantly different from each other.*

Project 3: Arthropod pest survey:

Methods: Seven hop yards in Vermont were scouted for arthropod pests and natural enemies every other week June-August for three years (2012-2014). The goal of this project was to identify the major arthropod pests and gain an understanding of any natural enemy presence. Hop yards varied in location, acreage, cultivar diversity, and management practices. Scouting took place every other week for a total of 6 collection dates at each location (including the UVM Variety Trial) annually. A group of 5-7 plants was considered a plot. Three leaves on one plant in each plot were sampled during each visit between ground level and 2 m. Both top and bottom leaf surfaces were visually examined with Optivisor lenses (Donegan Optical Company Inc., Lenexa, KS). Arthropods were identified and counted in the field. Pests were identified to species level while natural enemies were identified to the level at which an ecological role could be assigned.

Results: The major arthropod pests in NE hop yards were two spotted spider mite, hop aphid, and potato leafhopper. Larger yards had a higher total number of pest and natural enemy individuals. However, there were "hot spots" of pests present on small and medium sized yards. Where there were higher numbers of pests, the natural enemy community increased in abundance. This shows that healthy predator-prey equilibrium exists in some Vermont hop yards depending on management practices. Aphid and potato leafhopper natural enemy assemblages were similarly composed of generalist predators. Higher populations of hop aphid were observed in cooler, moister seasons while higher numbers of two spotted spider mite were observed in seasons of dry heat. Secondary outbreaks of spider mite were observed following broad-spectrum pesticide sprays targeted at potato leafhopper.

Project 4: Hop varietal susceptibility to potato leafhopper:

Methods: Potato leafhopper is a migratory pest of >200 broad leaf plants. Its arrival to the NE is dependent on spring wind currents and therefore unpredictable. This pest was observed to kill first year hop plants in 2010. During the 2013 field season we scouted the Variety Trial for potato leafhopper as described above. Using the scouting data collected in 2012 and 2013 we conducted a more in depth study on varietal susceptibility to potato leafhopper in 2014. A small hop yard was constructed at the UVM research farm containing the four least susceptible and 4 most susceptible varieties. Potato leafhoppers were released and photosynthesis was measured.

Results: During the 2012 and 2013 field season our Variety Trial scouting indicated differences in hop varietal susceptibility to potato leafhopper (**Figure 4**).

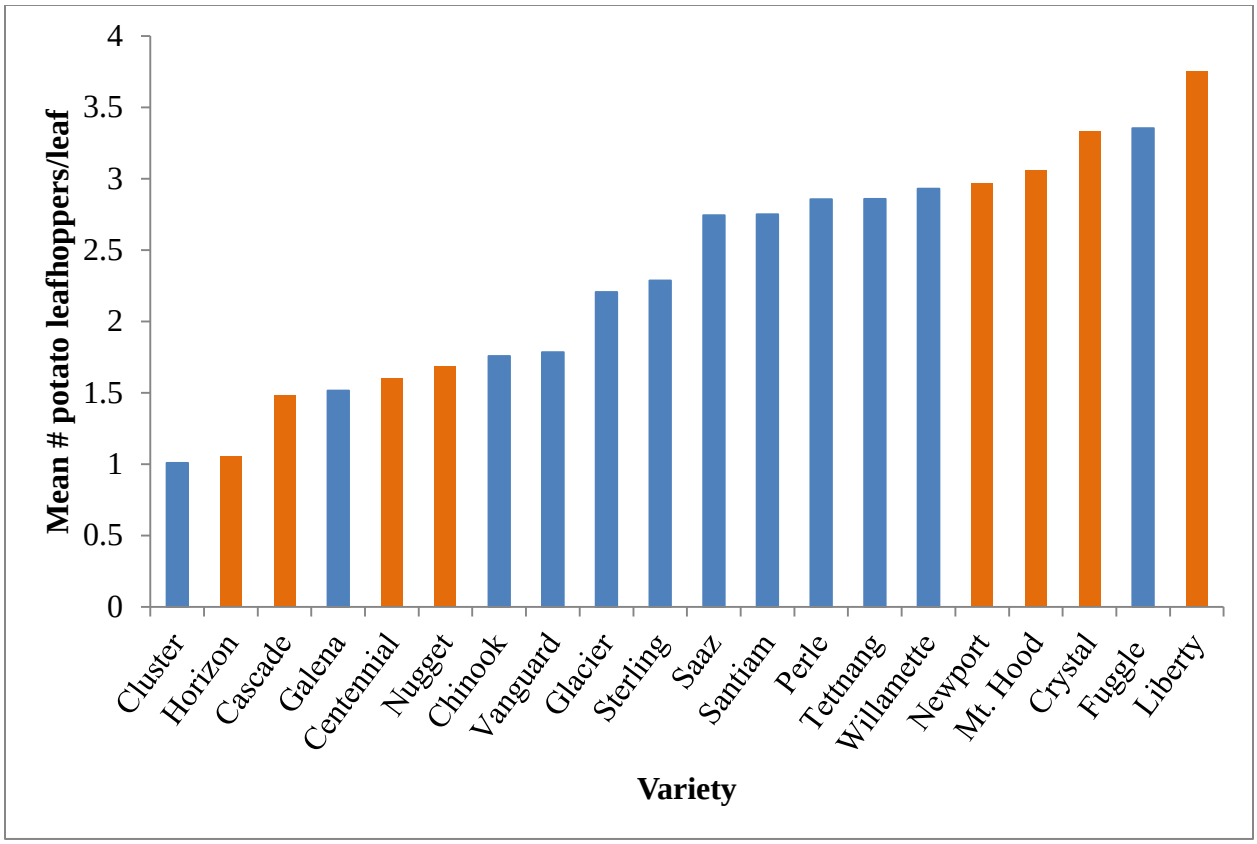

Figure 4: *The number of potato leafhopper nymphs and adults scouted on hop plants in the field. Values are a mean of 2012 and 2013 potato leafhoppers on 2nd and 3rd year plants. Varieties marked in orange were selected for further study.*

Project 5: Hop Yield and Quality by Variety:

Methods: Hops were harvested every year of the project duration. Hop harvest was targeted for when the cones reach 20 to 25% dry matter. We based harvest timing on preliminary dry matter tests and sensory evaluation. The hop harvest window was from mid-August to mid-September. Hops were harvested using the UVM mobile harvester.

Results: In 2013, varieties Chinook and Newport yielded highest at just over 600 lbs per acre (Figure 5).

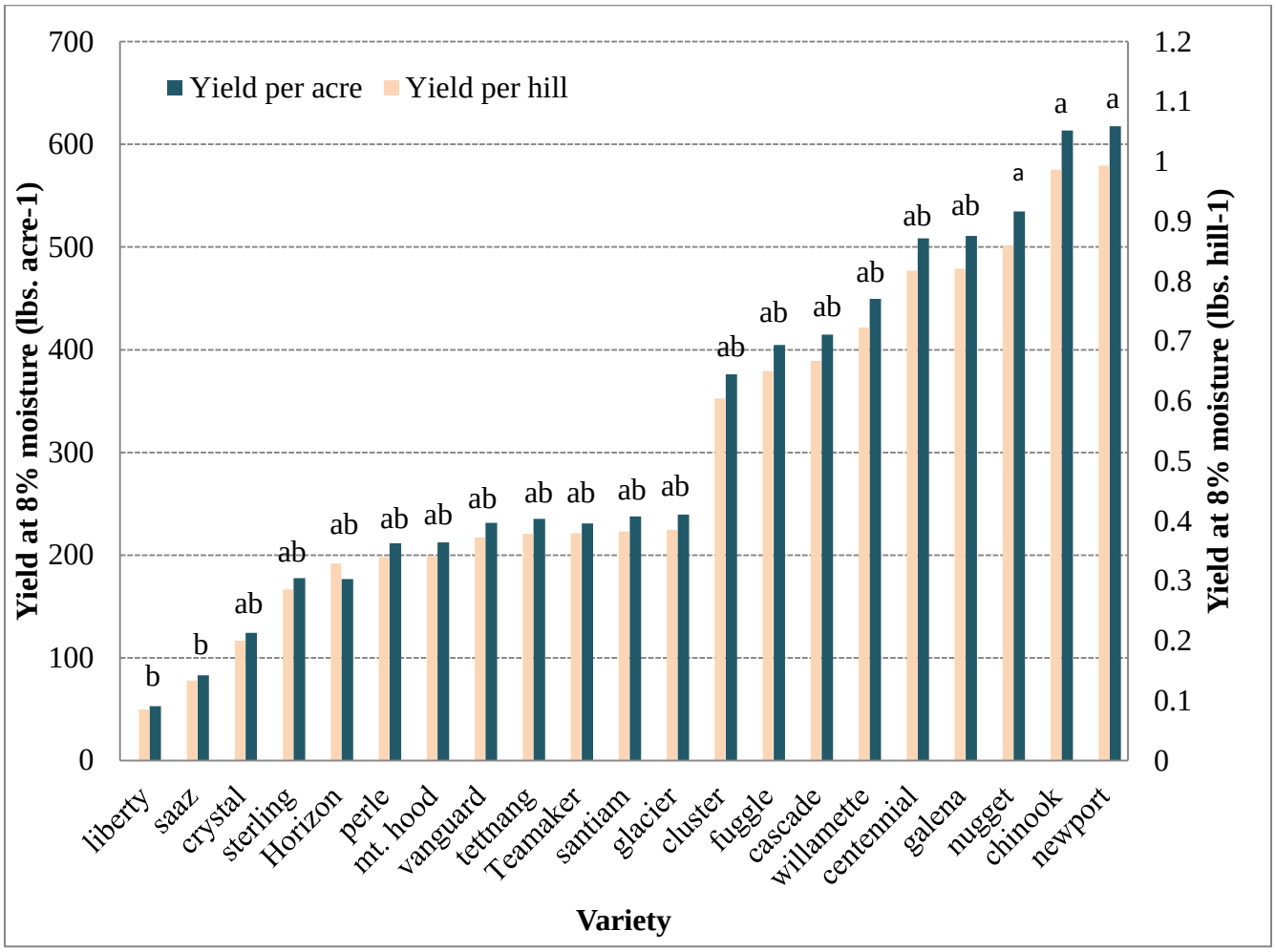

Figure 5: *Yield by variety at 8% moisture for the third year of harvest (2013) in the UVM Extension research hopyard, Alburgh, VT. Varieties followed by the same letter are not significantly different.*

In 2014, yields were higher on average. The varieties Cascade and Newport were highest yielding, producing over 800 lbs per acre, at 8% moisture. Saaz was the worst performing variety at 300 lbs per acre (Figure 6).

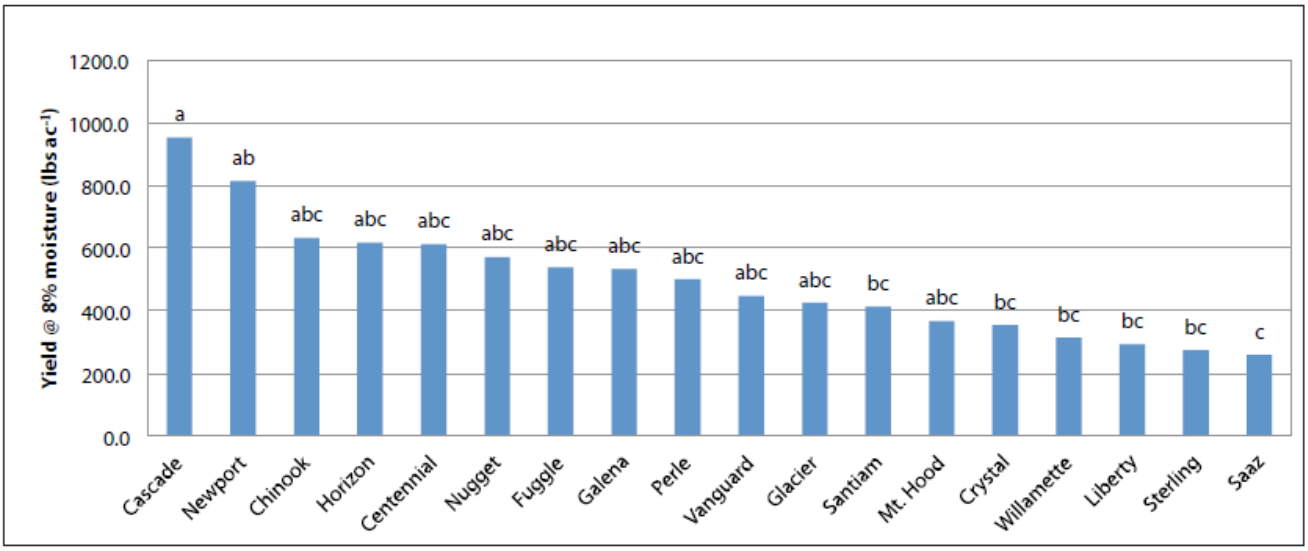

Figure 6: *Yield by variety at 8% moisture for the fourth year of harvest (2014) in the UVM Extension research hopyard. Varieties followed by the same letter are not significantly different.*

Tables 2 and 3 show hop quality test results from 2013 and 2014, respectively. While Beta acids were relatively consistent across the two seasons, Alpha acids were higher in most of the 2014 varieties.

Table 2: *Quality characteristics for hops from the 2013 harvest, Alburgh, VT.*

Variety	Alpha acids %	Beta acids %	HSI
Cascade	7.1	8.5	0.47
Centennial	9.2	5.2	0.28
Chinook	11.6	5.0	0.24
Cluster	7.2	5.4	0.22
Crystal	3.0	7.3	0.22

Fuggle	3.2	3.6	0.23
Galena	13.5	9.0	0.23
Glacier	5.6	8.7	0.23
Horizon	9.6	8.5	0.23
Liberty	3.6	3.9	0.25
Mt. Hood	4.5	8.2	0.23
Newport	11.5	9.2	0.23
Nugget	15.2	4.9	0.23
Perle	8.3	6.9	0.24
Saaz	2.0	3.1	0.24
Santiam	2.7	6.6	0.24
Sterling	4.5	6.1	0.25
Teamaker	1.4	10.7	0.22
Tettnang	3.3	3.6	0.28
Vanguard	6.1	7.9	0.24
Willamette	8.7	4.6	0.26

Table 3: *Quality characteristics for hops from the 2014 harvest, Alburgh, VT.*

Variety	Alpha acids %	Beta acids %	HSI
Cascade	7.4	9.0	0.23
Centennial	10.6	5.2	0.24
Chinook	8.5	5.0	0.25
Cluster	7.4	4.9	0.22
Crystal	4.1	7.7	0.23

Fuggle	3.8	3.9	0.27
Galena	11.0	8.6	0.25
Glacier	5.7	9.6	0.23
Horizon	11.7	9.0	0.23
Liberty	4.0	4.5	0.24
Mt. Hood	4.7	8.2	0.21
Mt. Rainier	3.4	12.4	0.23
Newport	11.7	9.4	0.25
Nugget	13.1	5.1	0.24
Perle	9.1	7.1	0.26
Saaz	3.8	4.4	0.23
Santiam	4.5	8.5	0.21
Sterling	5.1	6.0	0.25
Teamaker	1.6	10.1	0.20
Tettnang	3.9	3.5	0.28
Vanguard	7.7	9.1	0.23
Willamette	4.2	4.5	0.28
055	10.3	4.1	0.23
074	10.4	4.7	0.22

After four years of the UVM research Variety Trial, the most successful varieties were clear. Several varieties did not survive pest pressure or lacked winter hardiness. Table 4 indicates varieties that performed well and those that did not.

Table 4: *High and low performing hop varieties after four years of evaluation.*

High Performance Cultivars	**Low Performance Cultivars**
Centennial	Liberty
Chinook	Crystal

Newport	Saaz
Cascade	Sterling
Nugget	Cluster

Project 6: Hop Storage Study:

Once farmers have succeeded in harvesting their hops, the challenge of processing and storing remains. While there are established systems for hop storage on large scale farms in the Pacific Northwest, there is a shortage of information for the small scale growers of the NE. Many hop growers are choosing to vacuum-seal their hops in plastic bags. The goal of this project was to determine the effect of temperature on storage quality of dried, vacuum-sealed hops.

Methods: Hops were stored at three different temperatures for the study: room temperature, 37℉ (refrigerator) and 1℉(freezer). Nugget hops used were harvested in early September, dried to 8% moisture, and frozen in bulk vacuum-sealed bags for 7 months. Quality was measured shortly after the time of harvest. Samples were kept in each location for a total of 12 weeks.

Results: Shortly after harvest, the quality characteristics of the Nugget hops were 15.2% Alpha acid, 4.9% Beta acid and 0.23 HSI. Beta acids tested much higher at the beginning of the test (7 months later) than the Nugget hops that were tested at harvest, suggesting that there was some variability in the Nugget hops that we harvested or a possible change in testing calibration between harvest time and this storage test.. Table 4 and figure 8 show the final values of Alpha acids, Beta acids, and HSI (Hop Storage Index) after 12 weeks of storage. The treatment at room temperature degraded much further than the treatments in the freezer and refrigerator, which stayed relatively similar for the first two weeks before the refrigerator treatment slightly increased speed of degradation. It is clear however, that freezing results in the most stable storage. For very short periods of time, it may be acceptable to leave dried hops unrefrigerated, but any longer-term storage must be kept at a cool temperature to preserve quality. While freezing is ideal, refrigeration preserves quality almost as well within a 3 month time frame. For storage longer than 3 months, freezing is recommended.

Table 4: *Alpha acids, Beta acids, and HSI by treatment, Burlington, VT 2014.*

Temperature ºF	Alpha acids %		Beta acids %		HSI	
.2	12.16	a	9.64	a	0.211	b
37.1	11.73	b	9.21	b	0.215	b

72.4	9.80	c	7.63	c	0.358	a

Treatments indicated in bold had the top observed performance.

Treatments with the same letter to did not perform significantly different from each other.

HOP OUTREACH:

In 2013, 2014, and 2015 an extensive outreach program was implemented to deliver research based information to hop growers on a broad variety of topics. A diversity of educational delivery methods was implemented to reach the broadest audience possible.

Field Days and Conferences:

2013

Two on-farm field days were held in August 2013. The first field day was at Borderview Research Farm in Alburgh, VT on August 1st with 173 participants. The UVM Extension Northwest Crops and Soils team presented information during an afternoon session including yield comparison and weed control, hop pest management and hop diseases. We also had a brief steam weeding demonstration from a local hop grower.

On August 15, 2013, a field day was held at Four Star Farms in Northfield, MA. The L'Etoile Family hosted the field day and provided presentations on growing hops including planning, budgeting, building the hop yard, picking/harvesting, drying, compacting and packaging. The UVM Extension team also provided research updates on fertility requirements, variety selection, pest management and other best management practices. There were 122 attendees from Massachusetts, New Hampshire, New York, Vermont and Canada.

On December 1, 2013, Heather Darby attended and presented at the Cornell Fall Hops Conference. There were 365 attendees for the event. Her presentation focused on harvest timing and how to get started growing hops in the Northeast.

2014

One on-farm field days were held in August 2014. The field day at Borderview Research Farm in Alburgh, VT on July 24th had 226 participants. The UVM Extension Northwest Crops & Soils team presented information during an afternoon session including yield comparison and weed control, hops pest management and hop diseases. We also had a brief hop harvester demonstration. Downy mildew and potato factsheets were printed in the field day booklet.

The 5th Annual Hops Conference was held on February 27th, 2014 in Burlington, VT. There were 279 attendees from 6 states and 2 provinces. Over 2/3 of the attendees were beginning growers. The newly funded EPA project was highlighted and plans for upcoming research were delivered to the audience. Presentations also included "pest and beneficial arthropod identification", controlling downy mildew through crowning, and impact of potato leafhopper on hop growth and productivity. A guest speaker from Oregon shared his long history and experience with hop crowning as a means of downy mildew control. The attendees were surveyed to help identify current state of knowledge on several pests and pest management strategies.

2015

The annual field day at Borderview Research Farm in Alburgh, VT was held on July 23rd and had 238 participants. Hop highlights included 2014 crowning trial results, 2014 weeding trial results, biofungicide preliminary results, hop leaf lupulin gland counts by variety, vermicompost tea study, variety trial discussion, and a demonstration from HopHarvester.com.

Blog summary

2013

Monthly hop blogs continued and 21 blog entries occurred in between October 2012 to October 25, 2013. Topics included upcoming conference events, the 2012 Hops Variety Trial report, rhizome sales, an early hop growing checklist, frost seeding, hops data collection booklet, hops crowing video link, downy mildew alert, plant/insect diagnostic clinic information, pest scouting in your hopyard, the 2013 hops scouting report, mobile hops harvester summary for the 2013 summer, and an announcement for hops quality analysis now available by UVM lab.

Starting in May 2013, we started including articles in the Northeast Hops Alliance monthly online newsletter, which has a circulation of approximately 500. Articles were published on nitrogen management in hops, hop aphid management, mobile hops harvester update, and information on our events and the hops quality analysis testing.

2014

A blog post on the What's Hoppening Blog was posted on May 20th, 2014. This blog post included a picture and description of a downy mildew primary basal spike, a reminder to begin scouting for insects the first week in June, and a hop pesticide usage survey. The survey was also sent out to our hop grower email list to acquire as many responses as possible. The goal of the survey is to document pesticide usage information in regards to types, rates, and frequency of applications to hops. We will use this data to monitor impact from our project. In addition to this blog 6 other blogs were posted to highlight events, proper drying conditions, and pest scouting.

Other Commodities that benefited other than specialty crops.

No other commodities benefitted from the research and outreach on hops.

A summary of the contributions and roles of project partners

Project partners included farmers and brewers from the NE. An advisory team of farmers and brewers was initiated through our first SCBG. This advisory team consisted of 3 brewers, 4 researchers/extension, and 6 farmers. The advisory team met once per year at the annual NE Hops Alliance Conference held in December. The afternoon prior to the conference was set aside for the advisor meeting. The half-day meeting started with introductions and was followed by season updates from farmers and researchers. The last part of the meeting was used to discuss research and outreach priorities for the coming year(s).

In addition, to serving on the advisory team project partners also contributed by hosting field days, speaking at outreach events, and hosting research trials.

3) Goals and Outcomes Achieved

The outcome from this project was to see a measurable improvement in hop yield and quality on hop farms in the region. Through this work we expected a 25% increase in yield and a 50% increase in quality of at least 20 hop growers in the region.

The activities completed to achieve the performance goals and measurable outcomes are listed below:

- Hop research trials including variety evaluation, downy mildew and weed control trials, pest survey, and hop storage analysis trial were completed in 2013 and 2014.
- Field day at Four Star Farms, Northfield Massachusetts, August 15, 2013 (125 attendees)
- Hop projects featured at the 2013, 2014, and 2014 Annual Borderview Farm Northwest Crops and Soils field day (Average attendance: 200)
- Annual UVM Winter Hop Conferences: 2013 (202 attendees), 2014 (182 attendees), and 2015 (181 attendees)
- Presented research results at the 2012, 2013, 2014, and 2015 Northeast Hop Alliance Annual IPM Meetings and Cornell Fall Hop Conferences
- "What's Hoppening Blog posts included 17 in 2013, 11 in 2014, and 16 through July 2015
- YouTube videos in 2012: "Determining Hop Harvest Moisture and Ideal Storage Dry Matter" (3,727 views), "Scouting a Hopyard for Insects and Diseases" (3,790 views), "Hops- Here they Grow Again on Their Own" (2,083 views)
- YouTube video in 2015: "Getting Started with Growing Hops" (2,280 views)
- SurveyMonkey online surveys in 2013: "Massachusetts Hop Field Day" (53 respondents), "2013 Hop Conference Brewer Survey" (40 respondents), "2013 Hop Conference Grower Survey" (40 respondents)
- SurveyMonkey online surveys in 2014: "2014 Hop Ag Statistics" (45 respondents), "Fall Hop Grower Survey" (121 respondents), "2014 Hop Conference Brewer Survey" (11 respondents), "2014 Hop Conference Grower Survey" (64 respondents)
- SurveyMonkey online survey in March 2015: "2015 Hop Conference Grower Survey" (57 respondents)

This was an ongoing SCBG project funded for multiple years hence outcomes could be captured and measured more effectively over the final project period. Project beneficiaries were surveyed following outreach events to determine if information gained was implemented and if this led to improvements in hop production. Survey data also helped our project team develop our research and outreach agenda. Below are some key results from surveys administered in 2013, 2014, and 2015.

Survey Results:

From our 2013 Hop Conference Grower Survey, 100% found the UVM Extension NW Crops and Soils Team's presentations informative and educational. 11.4% indicated this was their first season in hop production and 31.4% were still in the planning stages. There were 22 hop varieties noted that growers had with the highest (85.2%) being Cascade. Growers selected these varieties because of brewer demand and information gained from UVM Variety Trial Research.

Of the respondents to the UVM Extension 2014 Winter Hops Conference survey (n=56), 38.5% increased acres of hops production, 23.1% improved weed control, 23.1% improved soil health, 15.4% improved crop yields and quality, 46.2% improved disease and pest management and 92.3% improved networking with others. A quote from one survey response included "I will be significantly informed when I do start growing hops, and much better able to discuss them with customers in our store." In addition, 92% stated that disease, insects and other pests were one of the major constraints to growing hops in the northeast, and 86% said that nutrient management was a major constraint. Responses from our 2014 Hop Ag Survey which included pesticide use questions indicated that 62% of respondents spray a pesticide and 76% of growers are conventional and still use organic products. This survey information has led to the development of pest related grants to assist growers with implementing more appropriate pest management strategies.

The final project survey (n=62) conducted at our 2015 UVM Winter Hop Conference clearly indicates that hop farmers have significantly benefitted from the project information. Thirty-eight people said that UVM helped them start or expand their hop yard and 42 people indicated that UVM helped them improve hop yields by an average 32%. Growers were asked if hop quality had improved as a result of UVM program and 58-responded quality had improved by 54%. Of those responding that quality was improved, 70% indicated that their quality levels increased to meet industry standards. In addition, 68% of respondents said that UVM helped them improve pest management.

Planned activities included:

- Field day at a hop yard in Massachusetts
- Annual UVM Winter Hop Conference
- Hop research presentations at two regional conferences
- Monthly blog posts on the UVM Extension hop blog called "What's Hoppening"
- One YouTube video on how to determine harvest moisture.
- End of project survey

Actual activities included:

- Field day at Four Star Farms, Northfield Massachusetts, August 15, 2013 (125 attendees)
- Hop projects featured at the 2013, 2014, and 2014 Annual Borderview Farm Northwest Crops and Soils field day (Average attendance: 200)
- Annual UVM Winter Hop Conferences: 2013 (202 attendees), 2014 (182 attendees), and 2015 (181 attendees)
- Presented research results at the 2013, 2014, and 2015 Northeast Hop Alliance Annual IPM Meetings and Cornell Fall Hop Conferences
- "What's Hoppening Blog posts included 17 in 2013, 11 in 2014, and 16 through July 2015
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- SurveyMonkey online survey in March 2015: "2015 Hop Conference Grower Survey" (57 respondents)

Hop growers throughout the Northeast have expressed their appreciation for regionally based research into hops production. Baseline data that indicates that farmers are improving yields and quality however survey data indicates that farmers still need more information to meet industry standard yields. Project beneficiaries identified future research priorities focused on pest and soil fertility management.

It is clear from surveys of beneficiaries that this project has clearly led to the increase in hop acreage, yield, and quality throughout the region. Survey data indicates that information from the UVM Hops Program has helped them expand or start a hop operation and improve yields and quality. Although not clearly linked farmers also indicated that the UVM Hops program helped improve soil, insect, disease, and weed management, which may have partially contributed to increased yield and quality.

4) Beneficiaries

As of the end of this project there were more than 350 acres of hops in the Northeast (NE) with hop yards ranging in size from 0.25 to 25 acres. These farms are increasing their hop acreage and new growers continually enter the scene. The farmers that are currently and intending to grow hops were the primary beneficiaries of this project information. Secondary beneficiaries include crop consultants and other related industry that work with farms on producing hops.

More than 10,000 beneficiaries attended conferences, field days, workshops, or accessed online educational materials developed through this project. Based on survey data farmers have increased hop yields on average 32% and quality levels by 54% through the implementation of information learned through the UVM hops program. A yield and quality increase will lead to improved revenue for the farmer.

4) Lessons learned

Hop production is expanding rapidly in the NE. With this expansion comes a demand for information on how best to grow this crop in our region. Unfortunately much of the agronomic information for producing hops is found in the west coast a climate that differs substantially from the NE. Developing accurate crop production recommendations for a new crop is time consuming and expensive. Through this project the UVM Hops Program was developed and has begun to create a framework for research and outreach in the NE. The data collected and distributed has been widely used by beneficiaries with our region and far outside of its boundaries. It is clear that this initial data has played a significant role in helping to grow and stabilize this fledgling industry. Although farmers have begun to see increased yields most yields are still well below those of western hop farms. Farmers and researchers have identified next tiers of critical information required to push hop production to more acceptable yields. The most critical steps are to develop regional fertility requirements as well as better pest management tools.

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Organization: New England Apple Association

Project Title: "Enhancing New England's Apple Orchard Varieties"

FY 2012 12-25-B-1467

Final report

1) Project Summary

The initial purposes of "Enhancing New England's Apple Orchard Varieties" was to educate consumers about Rhode Island's apple industry with photography from its orchards, and to develop the means to introduce new varieties to New England's growers.

Rhode Island's apple industry's is the smallest in New England, with just 230 acres in 2014, according to the USDA. When most consumers think about apples in New England, they generally think of the other, larger states. Rhode Island's apple industry is vital, but most of its orchards are small; the largest, Steere Orchard in Greenville, is only about 25 acres. Most of the state's apple crop is sold direct to consumers, through pick-your-own operations, orchard stores, and farm stands. On such a small scale, it has been challenging for the state's apple industry to find cost-effective ways to raise its public profile.

Newly developed varieties for the mass market are now almost universally trademarked, and New England orchards lack the opportunity or financial resources to purchase licenses to grow them. Without the opportunity to introduce new varieties, it will become more difficult for growers to keep and attract new customers in the future. This two-state project with Massachusetts and Rhode Island sought to introduce to New England new varieties under development that lacked some quality for mass production on a national scale, but that might excel in our region's soil and climate.

The project did not build on a previously funded project with the SCBGP or SCBGP-FB.

2) Project Approach

Project director Russell Powell, senior writer and director of special projects for the nonprofit New England Apple Association, consulted with researcher Heather Faubert of the University of Rhode Island and other leaders of the Rhode Island Fruit Growers Association to identify orchards and subject matter for photography. Powell successfully scheduled and oversaw the photo shoots, and edited the results. Photography — two days each by Powell and Bar Weeks, executive director of the New England Apple Association — was scheduled in each of the four seasons.

In consultation with Weeks, Powell selected images from Rhode Island's orchards for the 2014 and 2015 New England Apples wall calendars, and the association website (newenglandapples.org), weblog (newenglandorchards.org), and quarterly newsletter (*McIntosh News*).

The goal of introducing new varieties into New England encountered several obstacles. The original proposal had to be amended in light of the unexpected decision of Cornell University's apple breeding program to decline partnering with the New England Apple Association to develop one or more new varieties for our exclusive cultivation. The amended plan was to undertake additional research and seek out other institutional partners to develop new varieties for New England's orchards.

Powell reached out to David Bedford, head of the apple-breeding program at the University of Minnesota. That program has developed such varieties as Honeycrisp, Zestar! and SweeTango in recent years; the latter, a new entry introduced in 2012, is trademarked and cannot be cultivated by New England growers. Due to the university's success in developing new varieties that tolerate Minnesota's cold winters, this looked like a good match with New England's orchards on horticultural grounds.

Bedford has agreed to evaluate apples under development to determine which, if any, have potential for New England. If so, Bedford will supply the Association with samples so New England growers can assess such critical consumer traits as taste, texture, and color.

Powell also contacted Phil Baugher, president of Adams County Nursery in Pennsylvania, one of the leading suppliers of trees to New England's apple industry, and a supplier to a second apple-breeding program, based at Rutgers University in New Jersey. Its climate should be compatible for most varieties, and the program has already produced several cultivars that have succeeded in New England, including Jersey Mac and Suncrisp.

Powell researched the various models that have evolved in trade marking apples since the name Pink Lady was trademarked to market the Australian variety previously known as Cripps Pink, in 1989. He contracted with patent attorney Deborah Basile of Doherty, Wallace, Pillsbury & Murphy P.C., in Springfield, Massachusetts, to research and report on the legality of trade marking a new brand name for cultivars that may be chosen for trade marking.

Neither the Minnesota nor Rutgers programs have produced candidates for New England growers to date, however. After consultation with growers and industry leaders, Powell also anticipated reluctance among New England's medium to small-sized orchards to commit the

time and money for trials on unproven varieties that could take years before providing a significant return on their investment. In light of this, he came up with an innovative idea that greatly reduces the growers' risks: to rebrand and trademark one or more existing cultivars that have outstanding features but that have underperformed in the marketplace.

An attractive apple for this approach is Jonagold. A 1968 cross between Golden Delicious and Jonathan developed at Cornell's New York Agricultural Experiment Station; it has become popular in Europe but has failed to duplicate that success domestically. This is perplexing, as Jonagold has good size, outstanding color and flavor, and a distinctive texture similar to Honeycrisp — the most popular new variety to hit the United States in the past several decades.

One theory about Jonagold's lack of commercial success in the United States is its name, which fails to communicate its distinctive beauty or flavor. The apple's name is strictly botanical, a simple amalgamation of its parents' names, chosen during an era before marketing considerations guided the process for naming new varieties.

As a result, on crowded produce shelves Jonagold cannot compete with either well-known, traditional brands like McIntosh or Cortland, or new, market-driven brands like Smitten, Jazz, or Envy. New York State introduced two new managed varieties in 2014, Ruby Frost and SnapDragon, whose names were carefully vetted before their release (both of these trademarked apples can only be grown in New York State).

Patent attorney Basile determined that New England's growers are legally able to market Jonagold under a new, trademarked name for their exclusive use. The cultivar name Jonagold cannot be trademarked, but it can be rebranded and legally protected with a new, trademarked name.

The initial response to this idea among growers was very positive. Most agree that Jonagold is an outstanding eating apple, and New England growers have experience growing them, albeit on a relatively small scale to date.

This strategy will allow New England's apple industry to capitalize on the potential of this variety in a unique way, minimizing risk to growers by providing them immediate returns for Jonagolds already bearing fruit as they simultaneously invest in planting new trees to meet the anticipated increase in demand.

When presented with them, New England's growers can still test apples under development from the University of Minnesota and Rutgers, but in the meantime they can add variety and distinction to their orchards in a way that fits the size and resources of our industry.

Powell conducted taste tests with Jonagold at several consumer events in Massachusetts in the fall of 2014, including Tower Hill Botanical Garden in Boylston, Historic Deerfield in Deerfield, and the Eastern States Exposition in West Springfield.

In May 2015 Powell contracted with Marketing Specialist Joanne Scheuble of Cambridge, Massachusetts, to 1) research and plan to develop an appropriate process for understanding the attributes of Jonagold and considerations around its new name; 2) conduct structured telephone interviews with key stakeholders to gather facts and perceptions about Jonagold and the market; 3) identify potential new names using established techniques for generating successful product names, and test for trademark availability; 4) recommend a new name in consultation with project director Powell, executive director Weeks, and stakeholders; and 5) test the new name with consumers at the 2015 Eastern States Exposition and other venues.

At the conclusion of this process, the name JuicyGold was chosen as the New England brand name for Jonagold. Patent attorney Basile has filed the federal trademark application, and the name is expected to be approved in early 2016.

These are the main factors in choosing the new name:

1) JuicyGold is close to Jonagold, so it is not likely to confuse consumers the way Crispin — a new name for the Japanese apple Mutsu — did when it was rebranded in England in 1968.

2) Each word — "juicy" and "gold" — says something about the experience of eating the apple. Jonagold, in contrast, is strictly a botanical name.

3) "Juicy" was the term used most frequently to describe Jonagold by growers and other stakeholders interviewed by Scheuble. (Interestingly, no other apple has "juicy" in its name.)

4) The capital "G" on gold is a double entendre, referring not just to the apple's color or its Golden Delicious parent, but also as something of great value.

5) Putting them together in the same word is consistent not only with "Jonagold," but with recent apple names like CrimsonCrisp (2005) and RubyMac (2007).

JuicyGold is a solid name that will endure.

3) Goals and Outcomes Achieved

Outcome #1 of the grant project, greater awareness of Rhode Island orchards and the varieties they grow, met with some success:

Rhode Island orchards were featured in the 2014 New England Apples wall calendar on the cover (Dame Farm and Orchards), April (Rocky Brook Orchard), and August (Steere Orchard), and in 2015 in March (Sweet Berry Farm), August (Steere Orchard), and November (Hill Orchards). Photography from Rhode Island orchards was published on several occasions in the newsletter *McIntosh News* and the weblog newenglandorchards.org.

Collectively, the calendars, newsletters, and weblog have reached more than 100,000 consumers. The photography will continue to be used going forward.

The expected measureable outcome of a 20 percent increase in hits to the New England Apple Association website, newenglandapples.org, was surpassed, to an increase of more than 33 percent, from 2,485,219 hits in 2013, to 3,346,820 hits in 2014.

Rhode Island's growers did not realize a 10 percent increase in sales above the state's five-year average of 57,000 boxes, however, as a result of a smaller crop of 54,000 boxes, below the state's five-year average of 57,000 boxes. The smaller crop was a result of several weather-related factors, including an increase in the bacterial infection fire blight, and uneven pollination during spring bloom.

Outcome #2, ensuring that New England's growers have access to new varieties, has also met with partial success:

JuicyGold, the new trademarked name for the cultivar Jonagold, will help the apple fulfill its enormous potential as a premium variety, and identify it as New England grown.

The new name was introduced at the 2015 Eastern States Exposition in September in the New England Apple Association booth in the Massachusetts Building, and JuicyGold received a very

positive response. Most apple varieties at the booth were sold during the fair for 50 cents apiece; the premium variety Macoun was sold for $1, Honeycrisp $1 or $2. JuicyGold was sold at $1, with no question or complaint.

The New England Apple Association is now working on a strategic rollout of the new name JuicyGold for the 2016 fresh harvest, working with organizations like Red Tomato, a high-end produce company serving all of New England. Growers like Pine Hill Orchards in Colrain, Massachusetts, have already begun planting more Jonagold in anticipation. The New England Apple Association has a pending Specialty Crops Block Grant proposal with the Massachusetts Department of Agricultural Resources to promote JuicyGold with in-store tastings, a video, and other promotions, and anticipates seeking matching Specialty Crop promotional funds from at least two other New England states in FY2017.

The goal remains to position JuicyGold as a premium apple $5 per box price more than traditional varieties like McIntosh and Cortland (currently at about $20 per box), but we will not have data for at least another year.

The goal of identifying new apple varieties for cultivation in New England has produced potential partners in the University of Minnesota and Rutgers University apple breeding programs, although no cultivars had been submitted for consideration by the end of the grant period.

4) Beneficiaries

All of Rhode Island's approximately 25 commercial apple growers plus related industries benefited from the higher profile achieved from the photography and its inclusion in New England Apple Association print and online publications.

The 2014 Rhode Island apple crop was just 43,000 42-pound boxes, well below the state's five-year average, which dropped to 53,000 boxes. The 2015 crop is estimated at 55,000 boxes, a 28 percent increase over 2014. At $20 per box (average price for leading varieties like Cortland and McIntosh), this represents an increase in revenue of $240,000 in 2015 compared to 2014.

Every one of the 300-400 apple growers in New England stand to benefit by adopting the trademarked name of JuicyGold for Jonagold. The new name will identify JuicyGold as a premium, New England-grown apple. There is no available data on existing Jonagold trees in New England, but more are already being planted for 2016.

At the premium price of $25 per box, every interval of 10,000 boxes will generate $250,000 in revenue, including $50,000 above the going rate for traditional varieties.

There were many lessons learned as a result of completing this project, including:

- While this could change, the threat to date from trademarked varieties imported from outside of the region has been less than originally anticipated, in part as a result of the strength of traditional New England varieties like Cortland and McIntosh, and in part because most of the trademarked varieties lack distinction and have not been widely available.

- The opportunity to bring in new varieties for exclusive use by New England growers remains a distinct possibility, but depends on the apple breeding programs to provide our growers with suitable candidates, and at the end of the grant period this has not occurred.

- If and when we can consider a new variety under development, it will need to be tested by growers and consumers for a period of years before its wide commercial release.

- Any new trademarked variety will need to be broadly available to New England's growers, or else a costly administrative and oversight program will need to be in place to protect and enforce use of the trademark.

- At the same time, to succeed, a trademarked name must be heavily promoted in its first few years. Without an adequate promotional campaign, any new apple may take years longer to succeed, if it all.

- We now have mechanisms in place to name and trademark an apple variety to help it reach its market potential, identify it as New England grown, and sell it at a premium price.

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Project Title: Growing fava beans as double cropping in Massachusetts

FY 2012 12-25-B-1467

Final Report:

Project Summary:

A proposal entitled “Growing fava beans as double cropping in Massachusetts” was funded by Massachusetts Department of Agricultural Resources” in June 8, 2012. Our initial market survey indicated that there is a huge market for locally grown fava bean and that several wholesalers expressed their interest in buying locally grown fava beans. We hypothesized that this project will benefit vegetable growers in Massachusetts by potentially providing an additional and growing market for fava beans as a new crop. The main goals of the project were:

1- *To demonstrate the feasibility of growing fava bean as a new cash crop to vegetable growers*
2- *To assess the contribution of fava bean to the nitrogen needs of the succeeding crop (sweet corn)*
3- *To publish a guideline on basic agronomic practices for economic sound fava beans production*
4- *To generate an Expense/income analysis.*

We believe we have exceeded accomplishments of the above four major goals by conducting additional on-farm trials which were not originally included in the initial proposed project. These extra trials included; variety comparison (eight varieties were tested), method of planting (direct seeding vs. transplanting), and studying yield performance of fava bean with different seed size to potentially reduce the cost of seed cost.

Did the project build on a previously funded project with the SCBGP or SCBGP-FB

“This project was not previously funded under the SCBGP.”

The Project approach:

A graduate student that was hired for this project along with two faculty conducted several on-farm replicated trials in 2013, 2014, and 2015 to investigate the feasibility of growing fava beans in Massachusetts and to collect basic information required for generating a guideline for growers. These trials included:

1) Determining the best planting row spacing

2) Studying the time of planting
3) Evaluating yield performance of eight fava beans varieties
4) The effect of seed size on yield performance
5) Contrasting direct seeding and transplanting fava bean as an alternative method of planting
6) Assessing nitrogen contribution of fava bean to the succeeding crop (sweet corn)

For task 1 we concluded:

- Fava bean can be grown in Massachusetts successfully only if it is planted in late March or early April.
- Fava bean can be transplanted successfully to the main field in late April. However, the seedlings should be grown in the green house only for 10-12 days before being transplanted.
- The optimum population density is between 28,000 to 30,000 plants per acre.
- Seeding rate to achieve the proper population varies significantly among fava bean varieties due to their seed size (weight).
- The available variety (Windsor) to the New England growers (Johnny Seeds) is not the best option for the growers. The seed cost is high (due to its large seed size) and its pod yield was not as high as some other high producing varieties tested in this project.
- We concluded that Aquadulce is the better variety for Massachusetts condition.

Unusual development in this task was susceptibility of fava bean to the chocolate bacteria disease that puts fava bean as a risky crop group.

For task 2 we concluded:

- Fava bean is an efficient legume crop in terms of fixing atmospheric nitrogen.
- After marketable pods were harvested, its residues contributed as much as 50 lb N/acre to the succeeding crop (sweet corn).

For task 3 we generated, published, and distributed fava bean growing guide, posted a YouTube, and published an article on CDLE Newsletter:

- http://ag.umass.edu/sites/ag.umass.edu/files/research-reports/fava_bean_guide_2.pdf

- A YouTube entitled “Fava beans - A new dual purpose crop for New England.” https://www.youtube.com/watch?v=n6W4EoQD2Q4.

- An article entitled “Feasibility of Growing Fava Beans in Massachusetts” was published and posted in “Crops, Dairy, Livestock, and Equine Newsletter: http://ag.umass.edu/sites/ag.umass.edu/files/newsletters/2014-spring-cdle-newsletter.pdf

For task 4 we concluded:

- On average, an acre of fava bean can generate up to $7,000.

Moreover, based on outcome of the research project as well as marketing, an expense/income analysis was performed.

At the beginning of the project, several vegetable growers showed strong interest to include fava bean into their crop rotation system. Grant coordinators and growers met in person several times. Contributions of collaborating growers to the project included I) identifying information needed for them to begin growing fava bean, ii) participating in field days and workshops, iii) providing information needed for cost/income analysis. However, all contributing growers decided to wait until the end of the project in order to make their final decision to include fava bean in their crop system. We believe the published guideline as well as the YouTube video will encourage many growers to begin growing fava beans in Massachusetts.

Goals and Outcomes Achieved:

The main goal of this project was to holistically studying the feasibility of growing fava bean in Massachusetts and to collect basic information that are required for growers who are interested in growing fava bean as a new multi-purpose crop in Massachusetts. We hypothesized that this project will benefit vegetable growers in Massachusetts by potentially providing an additional and growing market for fava beans as a new crop.

Following, we present the outcomes achieved in this project through tasks provided in the Work Plan of the approved project proposal:

Task 1: Introducing fava beans as a new cash crop for Northeast:

To fulfill this task, we conducted several replicated research trials at the University of Massachusetts Research Farm. A summarized report of the research projects and the measurable outcomes follow:

1- Row spacing and Plant Population:

Determination of proper plant population and row spacing are among the fundamental information required by growers. Prior to this project, in a two-year preliminary experiment we concluded that population of 28,000-30,000 plants per acre was the optimum/economical number of plants for growing fava bean in Massachusetts. In this project while we kept the population constant (28,000) we compared traditional wide rows versus narrow rows spacing. The results indicated that narrower rows (15”) yielded 15% higher than wider rows spacing (30”). This could partly be attributed to the fewer lateral branches that were formed in 15” rows. Plants grown in 30” row spacing produced more lateral branches which often produce fewer pods compared with main stem.

Row Spacing Inches	Pod yield per acre	Seed yield per acre	Pod # per acre	Moisture %
30	2829 a	643.5 a	26939 a	76.0 a

15	3251 b	645.1 a	29768 b	75.5 a

2- Date of planting and Seed size:

In general, the earlier fava bean is planted in spring, the better performance and higher pod yield can be expected. Our preliminary on-farm demonstrations showed that mid-March was the best time for direct seeding. However, in all three years during the grant period, the land was covered by snow in March and therefore was not workable. Results from this project clearly indicated that fava bean must be planted as soon as soil is workable in spring.

As following table shows, two weeks delay in planting reduced pod fresh yield by approximately 40% (averaged two years). The yield reduction was mainly attributed to 35% fewer pods and 30% lighter seeds as planting time delayed.

The general conception among growers is that larger seeds produce larger plants and therefore higher yield. However, traditionally fava beans seeds are sold in bags that contain various seed size. We hypothesized that plants with smaller seed size should yield almost the same as those with larger seed size. If our hypothesis was proven to be true, then growers could purchase less seeds to achieve 28,000 plants per acre. Alternatively, growers could harvest and sell the lower pods that contain larger seeds as fresh produce. Upper pods which often contain smaller seeds can be harvested and saved for planting in the following growing season. This could save growers a significant amount of money in seed cost.

The results of this project however indicated that crop yield reduced significantly as seed size reduced (table below). We concluded that only pods from second harvest which has medium size seeds can be saved for the next season. Smaller seeds can be saved and used as cover crop and not as cash crop.

Treatments	**Pod yield (lb/ac)**		**Seed yield (lb/ac)**		**Pod number /ac**		**Moisture (%)**
	2012	**2014**	**2012**	**2014**	**2012**	**2014**	**2014**
Planting Date							
Early	2788	2654	545	978	23,824	23,437	73
Late	1598	1645	518	554	14,257	16,548	71
Seed Size							
Large	2867	2781	614	1056	39,408	34,835	73
Medium	2664	2537	552	1008	36,638	32,414	72
Small	1435	1327	422	490	28,057	17,888	72
Mixed	1805	1563	538	569	31,446	19,906	73

3- Variety Trial and Seed Size:

Traditionally recommended population is estimated as weight not as a count. Currently, Windsor is the main variety available to the growers in New England (Johnny Seeds). However, Windsor is considered as large-seeded variety and on average there are 275 seeds per pound. Therefore a population density of 30,000 plants per acre and the current seed costs ($3.25/lb), costs growers $350 per acre to purchase seeds which seems not reasonable. Moreover, we found average pod yield of Windsor variety is not acceptable when compared with reported yield for other fava beans varieties in other locations.

We found there is a significant difference between fava beans varieties in regard to seed size. We evaluated seven other varieties of fava beans with various seed size in addition to Windsor variety in a two-year yield evaluation trial.

We concluded that the yields of very small seeds such as Bell bean or Sweet Lorane were much lower than larger seeds varieties. However, some varieties including Aquadulce, Early violletto, and Early white which have smaller seeds compared with Windsor, performed much better and out yielded Windsor.

Fava bean Variety	Seed size g/100 seeds	Pod wt. (lb/ac)	Seed wt. (lb/ac)	Pod no. (acre)	Seed no. (acre)
Bell bean	51	3328	1304	69,365	411,799
Sweet Lorane	68	1831	467	57,530	105,920
Early white	253	10582	3403	77,424	192,431
Aquadulce	265	15107	5952	116,620	327,923
Early violletto	280	12059	4444	80,112	224,207
Windsor	311	5144	1901	34,948	111,781
Delle casine	335	15201	4713	72,047	200,012
D’Aquadulce	392	5549	1611	41,400	65,004

4- Method of Planting:

Fava bean traditionally is planted directly into the field. However, in many years, due to the soil and weather conditions, early sowing which is highly recommended for growing in Massachusetts may not be possible. We hypothesized that growing fava bean in the greenhouse and transplant them into the main field could be considered as an alternative method of planting to guarantee early planting of fava bean.

Our results indicated that early transplanting (April 16) produced higher yield than direct seeding only in years that soil condition was not workable and direct seeding was delayed (such as 2013). However, when soil condition was workable (such as in 2015), direct seeding out-yielded transplanting method by roughly 15%. We also concluded that the

seedlings grown in greenhouse should not be taller than 6 inches for successful seedling establishment in the field. In green house, it usually takes roughly 12 days from seeding to reach this height. Also we found that as transplanting delayed, pod yield reduced dramatically.

Planting Method	**Planting Date**	**Pod Fresh wt.**		**Seed Fresh wt.**
		2013	**2015**	**2013**
2015				
Direct Seeding	April 1	6094	8329	1969
3271				
Transplaniting	April 16	6792	7052	2484
2507				
	April 23	4759	6250	1741
1754				
	May 1	4330	997	1728
323				

Task 2: Assessing Nitrogen Contribution from Fava beans to Succeeding Sweet Corn

As a legume crop, fava bean can fix as much as 100-140 lbs N per acre if all crops residue is incorporated into the soil. The goal of task 2 was to assess nitrogen contribution of fava bean when some pods are harvested as cash crop and the residue which is still rich in nitrogen is returned to the soil.

In this project we planted fava bean in three dates in August. We hypothesized that growers can harvest some of the pods in October and the residues will serve as a legume cover crop until it will be killed in winter. We also assumed that the earlier fava bean is planted in August the larger plants will be and therefore more atmospheric nitrogen should be fixed. Results of this part of the project revealed that:

a) Fava bean will not produce significant amount of harvestable pod if planted in August. Therefore we recommend for late season dual purpose growing, fava bean must be planted not later than mid-July.

b) Fava bean residues contributed significant amount of N to the succeeding crop (sweet corn) grown in following spring. We found that nitrogen contribution to the sweet corn was as much as 50 lbs per acre. Sweet corn planted into fava bean residues plus 50 pound nitrogen produced as much as sweet corn marketable ear as those which received 100 pounds of nitrogen without fava bean residues.

Treatment	ME#/ac		MEFW (lb/ac)		EL (inch)		UE (%)	
	2014	2015	2014	2015	2014	2015	2014	2015
Fava bean planted on;								
August 1	20969	22421	120677	106479	6.9	6.3	5.8	11.1
August 8	20162	21292	113579	92283	6.9	6.1	7.2	16.4
August 16	19679	19679	99381	81635	7.1	6.0	8.5	18.3
N Rate + FB residue								
0	18549	15000	88733	56789	6.9	6.1	10.0	16.4
25	20001	22098	113579	99381	6.9	5.8	7.2	17.2
50	21775	23388	120677	106479	7.1	6.3	5.6	14.3
75	21130	22259	117128	99381	7.0	6.2	7.1	14.5
100	19840	23227	113579	102931	7.0	6.2	8.6	16.1

ME# = Marketable ear number, **MEFW** = Marketable ear fresh weight, **EL**=ear length,
UE% = % of unfilled ear tip

Task 3: Fava Beans Cultivation Guideline

We used our own data that were collected in this project as well as other existing references to publish a guideline. "A Guide for; Growing Fava beans in Massachusetts." Is a 24- page monograph which was produced through this grant. Copies of the monograph were given to the attendees of 2015 UMass Field Day. It is also posted on UMass Extension Crops, Dairy, Livestock, and Equine website. The guide can be found through the following link:

http://ag.umass.edu/sites/ag.umass.edu/files/research-reports/fava_bean_guide_2.pdf

Through this project, we also generated a video entitled “Fava beans - A new dual purpose crop for New England” which is uploaded on YouTube: https://www.youtube.com/watch?v=n6W4EoQD2Q4.

To fulfill this task even more efficient, we published an extension article entitled “Feasibility of Growing Fava Beans in Massachusetts” in Crops, Dairy, Livestock, and Equine Newsletter “Volume 17(2): 2-3. This two-page article can be found using the following link: http://ag.umass.edu/sites/ag.umass.edu/files/newsletters/2014-spring-cdle-newsletter.pdf

Task 4: Expense/Income analysis

Based on our activities during 2012-2015 growing seasons we generated an expense-Income analysis (next page). Enterprise budget with variable costs for fava beans (Vicia fava) based on research at the UMass Research Farm revealed that growers could generate $7,000 per acre or even more if the following conditions are met:

1- Fava bean is planted as early as possible in late March – early April. Early planting is crucial to successful cultivation of this crop to avoid chocolate bacteria disease which otherwise can destroy the whole crop.

2- An alternative variety of fava beans (such as Aquadulce) as oppose to Windsor with smaller seed and higher yield be selected.

3- Proper crop rotation and effective weed management be implemented.

Enterprise budget with variable costs for fava beans (Vicia fava) based on research at the UMass Research Farm in 2012-2015.

	Labor costs/acre	**Equipment cost**
	Labor hrs	Machinery hrs
	($14.00/hr)	($20.00/hr)
Taking soil samples	0.5	-
Plow	0.5	0.5
Disk	0.5	0.5
Apply lime and fertilizer	1	1
Sowing	2	2
Herbicide application	1	1
Weeding (cultivator)	15	6
Harvest (3 times-total)	15	-
Packing	60	-
Deliver to Wholesaler	5	5
Total hours	100.5	16.00
Total costs (labor and equipment)	**$1,407**	**$320**

Cost of Materials (based on 1 acre)

Soil lab fee (2 times)	$30
Seed (110 lb seeds/ac @ $3.25/lb)	$360
Fertilizer	$100
Herbicide	$120
Boxes (500 boxes @ $1.50)	$750

Total cost material	**$1,360**

Total costs and returns (based on 1 acre)

Labor costs	$1,407
Machinery hrs	$320
Material costs	$1,360
Total costs	$3,087
Total returns (based on average of 10,000 lb pods per acre harvested at 2-3 times @ $1.00/pound)	$10,000
Net (Total returns/costs)	**$6,913**

Beneficiaries

Vegetable growers, especially those who are involved in farmers markets and CSAs, are always looking for new markets. Fresh fava beans pods are commonly found in markets that cater to growing ethnic groups. Pods of fava bean can be harvested for fresh market in the spring while the remaining plant material can be incorporated into soil and contribute significant amount of nitrogen to the following cash crop that is planted in July. Growers have expressed their willingness to grow alternative cover crops to winter rye to boost their income and improve their soil quality. Through this project we concluded that fava bean can be planted in mid-August as a legume cover crop or planted in Mid-July as dual purpose (cash/cover crop).

Unfortunately grant coordinators do not have a complete record of vegetable growers who actually have started growing fava beans as a result of this project. We have received many inquiries during annual summer field days, as well as email, phone. Many growers expressed their interest but are waiting to read the growing fava bean guideline (which is now available) and watch video (which is now uploaded on YouTube).

The marketability and cost/income analysis performed through this project is attractive enough to many vegetable growers

Outcomes and Lessons Learned

The major outcome of this project can be summarized as following:

1. Fava bean can be planted successfully in Massachusetts weather condition.
2. Successful growing fava bean requires an early planting, as soon as soil is workable in spring.
3. Fava bean can easily contribute approximately 50 pounds of nitrogen to the succeeding crop (sweet corn).
4. We recommend a population density of 30,000 plants per acre with 15 inch row spacing.
5. Windsor variety which is currently the only available variety to growers in Massachusetts is not the highest profitable variety and should be replaced by smaller seed size and higher yielding varieties such as Aquadulce or Delle casine.
6. Although transplanting can be considered as an alternative method to grow fava bean, direct seeding from mid-March through mid-April is more economical and therefore recommended.
7. When an appropriate variety is used and planted as early as possible in spring, one acre of fava bean can generate roughly $7,000 per acre.

Work Plan:

The work plan was adjusted to be conducted in fall 2013 (year 1) and 2014 (year 2), 2015 (year 3). Although initially two-year field trial was planned due to cop loss to root rot disease grantors repeated all on-farm trials for the third year without extra budget.

Task	Deadline	Outcome	Status
Phase 1	Fall 2012-Winter 2013	Hiring grad student, meeting with interested farmers	Completed
Phase 2	Spring 2013-Fall 2013	Replicated research trials including: date of planting, row spacing, seed size, method of planting, variety testing, assessment of N contribution from fava bean to sweet corn	Completed
Phase 3	Summer 2013	Field day, workshop	Completed
Phase 4	Winter 2013	Collected data analyzed and published in CDLE Newsletter and	Completed

		Agronomy Research Report	
Phase 5	Spring 2014	Replicated research trials repeated but lost to root rot disease	Failed
Phase 6	Spring 2015-Summer 2015	Replicated research trials repeated for the third time	Completed
Phase 7	Summer 2015	Field day, generating educational materials including fact sheet and farmers' guideline	Completed

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	Labor hrs ($14.00/hr)	Machinery hrs ($20.00/hr)
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Herbicide application	1	1
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Organization: MNLA

Project Title: Promoting Water Conservation Practices

FY 2012 12-25-B-1467

Final Report

Project Background & Summary

Water has been called the issue for the 21st century. The problem has already hit the Massachusetts garden centers, nurseries, landscape professionals…and consumers. We are competing for water for our survival.

For the purposes of water restrictions, our products "annuals, perennials, trees & shrubs" are classified as non-essential, outside watering. When outdoor water restrictions are imposed, people are not allowed to water plants and trees, except perhaps with hand-held hoses; therefore, they hesitate to buy in the first place.

The Massachusetts Flower Growers' Association and the Massachusetts Nursery and Landscape Association, together, want to be pro-active in assembling existing research and data on water usage when watering outdoor plants and using that information to educate our members and consumers about the best ways to conserve water without hurting the plants, the environment or the industry.

The challenge of maintaining the competitiveness of the *national* horticultural industry goes far beyond what varieties we plant, how we market and how we price our products compared to other states and/or countries. The challenge is increasingly about access to water.

The changing weather patterns in this country are creating a new reality. In fact, the USDA recently introduced a revised "Hardiness Zone Map" that reflects warmer temperatures. All states are likely to face seasonal or long-term droughts. Some are experienced with droughts and know what policies and practices work. For others, this is all new. But there is no centralized or comprehensive source (like a library) of scientific research, technologies and practices that are available to government, the industry or homeowners.

When outdoor water restrictions are imposed, communities, homeowners and municipalities can be prohibited from using outside water on school gardens, community gardens, and home/business landscapes. Without watering, new plants are at risk of disease and death. For the end-users and the green industry, this creates a frustrating cycle of consumer disappointment and lost economic viability for the industry.

Some communities, operating within Massachusetts Department of Environmental Protection (DEP) guidelines, allow hand-held-hose watering of landscapes flower and vegetable gardens,

but this is a very inefficient way to water for both the plants and the people. We believe that it wastes water, which also costs the homeowner money. It obviously wastes the time of the homeowner. And generally, it is not done in a way that supports the health and growth of the plants. People apply too little, or too much, at inappropriate times of day as mandated by the restrictions. And certainly government staffs do not have the time and to be watering public spaces by-hand.

Water has been called the defining issue for the 21st century. The issue is not limited to those states or countries that have traditionally been short of rain, i.e. Arizona, New Mexico. Today's climate is changing and now states like Massachusetts, where water was never an issue except for the sporadic, localized crisis, today face annual restrictions.

In April 2012, the state began developing a water management plan that would ban non-essential water use. The outdoor water restrictions are limiting the consumer and the horticulture industry by restricting water use for plant health. The restrictions directly impact all aspects of agriculture from the home vegetable grower to the large nursery operator. A Water Commissioner who did not understand the value of drip irrigation in one community told a landscape professional who was trying to explain how drip irrigation would be better for water conservation said that, "Those plants are not important."

What? Plants are essential to the air we breathe, the food we eat and the water we drink. We must find a balanced solution for water usage; not just because we want to sell plants and trees but because plants (any kind of plant), trees and shrubs are valuable to the environment. The proper placement and use of them can reduce energy costs, clean the air of carbon dioxide, filter ground water, limit erosion, and provide food and habitats for wildlife, and more. We all rely on plants to sustain a healthy environment for now and future generations.

And there are economic considerations. All jobs, all businesses are important to Massachusetts, and horticulture is the major agricultural industry in the state. According to a 2009 study by Vermont and Maine Extensions, there are more than 5,000 businesses employing 68,000 people (63% fulltime) generating gross income of $2.6 billion. And there are other costs that are must be considered: lost business and real estate taxes, costs to remove public safety hazards when trees die, and energy costs that rise.

Right in the city of Worcester where thousands of trees were lost to the Asian Longhorned beetle, Ben Weil, an energy professor at UMass Amherst, quantified significant increases in energy costs as a result of the lost trees. Let's not even consider what a difference those trees made on our carbon footprint. There are moves to replace those trees and the ones lost in the tornado in the Springfield area. Our question…will there be water for them? These environmental factors need to be part of the discussion in the context of water conservation. Ironically, we are in a catch-22 caught between goals and agendas of different environmental efforts.

> For example, an EPA site states, "Shade trees and smaller plants such as shrubs, vines, grasses, and ground cover, help cool the urban environment. Yet, many U.S. communities have lost trees and green space as they have grown. This change is not inevitable. Many communities can take advantage of existing space, such as grassy or barren areas, to

increase their vegetative cover and reap multiple benefits[4]." But how can the plants survive without water?

The state/USA wants the nation to reduce our carbon footprint. So programs promote planting trees, but trees and plants (all of which reduce carbon dioxide) need water to survive. The environment needs more, not fewer, plants. But existing policies ensure failure.

Mainstream magazines and newspapers encourage people to plant trees and shrubs to reduce energy costs, but when homeowners hear about outdoor water bans, they become conflicted in how to proceed.

MDAR and Massachusetts Ag in the Classroom want school gardens in every town and city but will communities with bans allow them to be watered? What about their community vegetable gardens in the summer?

So how do we distribute limited water supplies so homeowners can comfortably start a garden or landscape their yards with the confidence that they will be able to care for them? We hope we can find the answers to that question in this grant project, because if we don't, this industry will wither and die – not just here in Massachusetts but in any and every state where climate conditions force categorical water restrictions and no reasonable alternatives are allowed.

Did the project build on a previously funded project with the SCBGP or SCBGP-FB

Yes & No! The project research and development was totally independent of previous "Plant Something MA" projects; we did however utilize the consumer outreach marketing tool of "Plant Something MA" to reach the consumer with the project results and development. www.plantsomethingma.org

Project Approach & Activities

Our first activity included the collection of information and research on all of the existing water management and conservation practices and technologies from around the country. This process included a review of these practices to better assess the best practices that would benefit Massachusetts.

Several meetings were held with the MA Office of Energy and Environmental Affairs and the Department of Environmental Protection following their release of the final version of its plan to manage water resources in the Commonwealth. The Sustainable Water Management Initiative,

[4] (From the Reducing Urban Heat Islands: Compendium of Strategies "This compendium was developed by the Climate Protection Partnership Division in the U.S. Environmental Protection Agency's Office of Atmospheric Programs."

or SWMI, has been in development for an extended period of time. This framework will guide the development of regulations regarding the use of water from virtually all sources in the state. These regulations have an enormous impact on consumer watering and subsequently plant purchasing.

Project Approach:

The ability for consumers to water their plant purchases was instrumental to plant sales. In Massachusetts; it is standard practice to engage an enforced water ban beginning May 1 through September 15. This city & town action was in direct re-action to the new DEP regulations for all water purveyors across the Commonwealth. This re-action directly impacted sales of specialty crop plants within this time period; if consumers could not water new plants installed and or purchased from garden centers; why invest in a new garden, landscape or plant purchase? The research, development and outreached that was realized by this grant have very effectively opened the doors and eyes of state officials that this type of blanket water ban is unnecessary and has a heavy impact on the value of plants and the environment.

Following the release of the SWMI regulations a meeting was facilitated by the MNLA/MFGA water conservation task force with DEP Commissioner Kenneth Kimmell and Representative Dykema and their respective staff members. The results of the meetings are still a work in progress, however strides have been made in finding a balanced solution for water usage; not just because our members want to sell plants and trees but because plants (any kind of plant), trees and shrubs are valuable to the environment and research has shown that proper watering techniques can save water. A win, win for everyone.

A gardening tips writer was contracted to provide weekly gardening tips that are focused on sustainable gardening, including watering wisely and right plant in the right place. These are posted on the PlantSomethingMA.org website as well as on the PS Face book page.

Educate the Massachusetts industry and consumers about the options so that homeowners are able to garden without fear that their plants will die during droughts.

Industry: We conducted focus groups to determine level of understanding within industry on the water issues facing the green industry within Massachusetts. In addition, we hired a professional researcher, Jeffrey LaFleur to assemble a compendium of existing national research and data on best practices that conserve water. This allowed us to further our work with MA DEP on one of the most singular negative impacts on planting in Massachusetts - the “water ban”. A water conservation task force was developed that included a diverse representation of the nursery, greenhouse, and landscape and irrigation industry. Members of the task force continued to meet with MADEP to discuss new technology in water use. A demonstration of drip irrigation systems and information on water savings utilizing drip irrigation was provided. MADEP agreed that they would amend municipal water management act permit language to include an allowance of the use of drip irrigation systems during times of municipal water bans. MADEP identified a need to conduct an education effort with municipal water departments on drip irrigation. A power point presentation of drip irrigation was developed and available to water purveyors. In addition, MNLA and MFGA have been invited to present at the MA and would

identify appropriate venues for MNLA/MFGA to participate in this effort. MNLA/MFGA sought to coordinate our education efforts with Irrigation Association. IA can provide technical expertise on drip irrigation and has a proven education program. A joint meeting with the IA was held in September to identify the information available to respective organizations and how we would coordinate based on DEP"s recommendations.
DEP communicated the appropriate communications vehicles to MNLA/MFGA in December so that we can begin developing materials that will best inform the end users.

Consumer: Utilizing the information garnered from the research assembled a gardening tips writer was contracted for 2013 and 2014. Weekly gardening tips are posted to the PlantSomethingMA.org website and face book page that are focused on sustainable gardening, including watering wisely and right plant in the right place. The tips have been produced by the graphic designer for inclusion on the website, face book and print materials. Outreach included the Boston Flower and Garden Show 2014 where rain barrel recovery was showcased from the greenhouse to recycled water in rain barrels. An expanded water conservation awareness display was completed for the Boston Flower and Garden show in 2015. Consumer interest and awareness was very high with follow up directed to the PlantSomethingMA.org website where the electronic materials were tailored made for homeowners.

Goals, Accomplishments and Outcomes Achieved:

We had three primary goals for this grant project.

The first was to assemble a compendium of existing national research and data on best practices that conserve water and can be applied to the Massachusetts landscape. This includes practices of utilizing more drip irrigation, soil sensors, rainwater harvesting, low-water-using trees and plants, and more. Desired output is a statistically accurate and scientifically defensible option that presents best practices to conserve water used outdoors on plants.

The second was to produce readable, user-friendly electronic materials that are grounded in facts and research data to describe the practices that would conserve water while preserving the other environmental benefits. The developed electronic documents were tailored to water purveyors, plant professionals and homeowners that can be easily printed for distribution.

The final goal is to promote conservation education among our Association members and through them, to educate their customers to introduce water conservation practices. We utilized many partner opportunities to execute this mission: The Plant Something website was utilized extensively to post the findings and opportunities; workshops were held at New England Grows and twilight meetings that included water conservation technologies, products and best plant education.

The goals were met and exceeded as we developed consumer and professional water wisely materials. This included the drip irrigation information brochure for the professional and water purveyors; as a companion an educational power point presentation was developed that can be

utilized by the professional to educate the consumer as well as water purveyors in all cities and towns across the commonwealth.

We accomplished the development of the electronic informational brochure which is available for download at www.plantsomethingMA.org and www.mnal.com. In addition, electronic consumer information and resources have been developed on the PS website (Utilizing a Rain Garden, Rain Barrels, Irrigation, Soil Structure, and Xeriscape). These are practical solutions for Massachusetts consumers that encourage continued growth of plant sales throughout water bans. The electronic brochure can be viewed on: http://www.plantsomethingma.org/water-smart-landscaping/

Comparison of Goals to Accomplishments

The goal to educate members of the MNLA and MFGA on the techniques, products and best practices related to water conservation from around the country, and has them educate their customers. The desired outcome is that members will use best water conservation practices in designs, plant selection and watering techniques and will educate customers accordingly.

An online survey as well as focus groups was held to measure the level of awareness on the subject. These results while not a scientific analysis proved that the majority of those surveyed online were unaware of water conservation techniques and products. The survey conducted immediately following the educational program "Water Conservation & Design Technologies".

A survey was conducted following this program; the following are the findings.

1 out of 3 members currently use best water conservation practices in designs, plant selection and watering techniques.

2 out of 3 members noted that the educational program titled "Water Conservation & Design Technologies" will influence their future water conservation practices.

On a scale of 1 thru 5 establishing awareness for designing with water conservation practices (5 being highest); 30% sometime designs; with 70% noted that they do not do design.

Outreach to more than 500 + industry professionals; through publications, workshops and the website. Based on the survey and focus groups, while not scientific there is a definite increased awareness of those the program reached and it is expected that more than 40% will integrate conservation practices into their operations, and 60% will promote conservation with their customers and will design and install planting projects with water conservation in mind.

3) To promote conservation education among our Association members and through them, to educate their customers to introduce water conservation practices. Utilize the Plant Something website to post the report; hold workshops, e.g.at New England Grows, Association annual meetings, stand alone workshop, at the Great Ideas Conference, and/or others. Desired output is to train 500 or more industry professionals.

The educational outreach exceeded 500 with programs completed at New England Grows, the MNLA Twilight Meeting, outreach within our publication "ProGrowNews" where two articles appeared with a circulation of more than 1,000 per issues and last but not least – our most recent presentation to more than 200 Massachusetts Municipal Officials where "drip irrigation" advantages were shared as an allowable use during water ban was very effective.

Beneficiaries

The beneficiaries from this project included the MA Department of Environmental Protection, the green industry as a whole, cities and towns across the Commonwealth, and frankly - anyone who wants to plant something!

More than 700 businesses that are members of MNLA & MFGA will benefit from the compendium of research and the education we provide. They will utilize applicable conservation practices in their own businesses, which can serve as examples for homeowners who want to see how something works before committing to it. There will be water savings and more people who know what to do. Members can now convey information to homeowners and businesses that they sell plants and services to. The MA Department of Environmental Protection will have access to our compendium of information from qualified resources and the environment will benefit from the advantages of healthy plants. Homeowners will be able to take up gardening, or any kind of planting, with confidence that water will be available if they practice good management and the industry will benefit because people will buy their plants and services.

As for economic impacts, it is impossible to know why plant sales increase – was it the advertising, the weather, or the improved economy? But it is very easy to predict, based on experiences of the past couple of summers, that business will be lost if water bans are implemented. We do know of one Holliston landscaper who lost a $30,000 job because of one community's ban in 2012. The homeowner decided not to move forward when the town would not allow any other practice than hand-watering. This is one story that now with the benefit of the work from this grant; will not be repeated.

Summary

Through the generosity of this grant we were able to assemble a compendium of existing national research and data on best practices that conserve water. This includes practices of utilizing more drip irrigation, soil sensors, rainwater harvesting, low-water-using trees and plants, and more. We developed materials that are statistically accurate and scientifically defensible that present best practices to conserve water used outdoors on plants.

We produce readable, user-friendly electronic materials that are grounded in facts and research data to describe the practices that would conserve water while preserving the other environmental benefits. We also developed electronic documents tailored to plant professionals, water purveyors and homeowners that can be easily printed for distribution.

We successfully promoted water conservation education among to the green industry and through them, to educate their customers to introduce water conservation practices. We expanded the resources of the Plant Something and MNLA website to include water conservation practices.

In addition, we developed the drip irrigation information brochure for the professional and water purveyors; as well as a companion an educational power point presentation was developed that can be utilized by the professional to educate the consumer as well as water purveyors in all cities and towns across the commonwealth.

Lessons Learned:

Lessons learned include that the state government process is a labor intensive and very slow process. Results of the research and development were achieved fairly quickly in the grant process however the sharing of this information with government officials was a lengthy meeting process. The however, is that it is achievable however you do need to have dedicated staff and/or volunteers to move this process forward.

We had hoped to educate officials, to have them recognize drip irrigation as an allowable use was an unexpected benefit that we hope will allow for other advanced technologies within the green industry to be considered as well.

Ensure your research is thorough; you must have hands on knowledgeable and articulate professionals at the table who are willing to donate many hours to the mission and last but not least; keep it simple on your presentation so that all levels can understand the issues and the solutions.

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Organization: MA Department of Agricultural Resources

Project Title: MassGrown & Fresher Promotes Specialty Crops through Consumer Events and Email Marketing

FY 2012 12-25-B-1467

Final Report

Project Summary:

The goal was to increase awareness and purchases of Specialty Crops in Massachusetts by focusing on two (never attended) large travel shows in MA (Boston Globe Travel Show and the AAA Travel Marketplace), as well as advertising in the AAA Travel newspaper (Horizon). We wanted to drive consumers to farms that sell Specialty Crops and to see if the materials we provided at the shows and e-newsletters we sent out impacted sales of Specialty Crops.

The motivation was to market Specialty crops to an untapped travel audience. With Mass. offering many opportunities to travel by car to many farms within an hours drive, the thought was to encourage day trips to farms offering Specialty crops. It was also an opportunity to remind the public of the many great specialty crops grown in Massachusetts.

This project did build upon a previous SCBGP project that assisted us mapping Specialty crop growers on a newly designed, easy to navigate, online map. We also had produced a 4 season recipe card spotlighting Specialty crops. The thinking was after they bought the crops, here was a

Project Approach:

a. Booth materials: We contracted with Fuse Ideas to produce materials for a booth display that focused on "Massgrown" Specialty Crops. It included a tradeshow booth display using photos of Specialty Crops (Exhibit 1), new recipe card brochure (Exhibit 2) that features Specialty Crops, a rack card that highlights the Massgrown website, www.Mass.gov/Massgrown, temporary tattoos (tomato, broccoli, carrots), along with fresh apples, maple syrup, and dried cranberry samples.
b. Booth display at the 10th Anniversary AAA Travel Marketplace, Foxboro, MA March 1-3, 2013. MDAR collaborated with two associations: The NE Apple Association and the MA Maple Association. Representatives from each association helped staff the booth over the weekend show, sampled 1,000 maple products and gave out over 2,800 McIntosh apples. There were over 18,000 attendees, and we captured 268 emails using the ipad template from people interested in subscribing to MDAR's MassGrown e-newsletter.

c. Booth display at the Boston Globe Travel Show - February 7-9, 2014. We collaborated with the MA Cranberry Growers Association and the MA Maple Growers Association. We sampled over 1000 dried cranberries (in cups) and four grades of maple syrup during the show. We had a maple syrup producer (Rob Leab) sample product and answer questions on behalf of the Maple Growers. We collected another 198 new email subscribers' for the seasonal MassGrown consumer e-newsletter. The attendance to the show was approximately 21,000 over the three days.
d. Horizon Newsletter – Contracted with H & A Media Group to produce and place an advertisement (3.75" w x 8.25"), in the September 2014 issue (Exhibit 3). We created a unique webpage (www.mass.gov/massgrown/aaa) specific to the ad to measure number of people who saw the ad directly from the newsletter and then typed in the web address. As an extra, we received a list of readers (570) who requested more information from us. The two photographs used in the advertisement were specifically used as they represented two Specialty crops: apples and pumpkins. The ad reached 723,000 subscribers.
e. Other Consumer Events we exhibited and sampled specialty crops at:
    i. --Boston Flower Show (no charge) – 60,000 attendees
    ii. --16th Annual Garlic Fest ($100) – 11,000 attendees: sampled apples and cranberries
    iii. --Eastern States Exposition (no charge) – 1.4 million attendees : sampled cranberries
    iv. --Mt. Wachusett Apple Fest (no charge) – 8,000 attendees: sampled apples and cranberries
f. Monthly E-Newsletters – From March through December 2013 and 2014, we emailed 14 (seven each year) "Massgrown" e-newsletters which spotlighted Specialty crops (example - Exhibit 4). March spotlighted maple syrup, May (flowers and plants), June (strawberries), August (peaches and blueberries), September (apples), October (cranberries), and December (Christmas trees). We specifically cross promoted and spotlighted Specialty Crops through usage of text, pictures and recipes in each of these e-blasts. This was a great tool to promote and educate the availability of these many Specialty crops in their specific month of availability to the public along with events that month. We also spotlighted and made prominent the Specialty Crop pictures and links on the "Massgrown" website (example - Exhibit 5)

g. Surveyed attendees that signed up at the AAA Travel Marketplace - We sent an email (Exhibit 6) with a link to a survey to the 268 emails that had signed up at our booth. We received a 13% return (37 surveys). Notable results (pdf attachment) included 81% stated they purchased a specialty crop (vegetables, fruit, honey, wine, flowers, maple) as a result of information on our website, map, or seasonal e-newsletter they received due to visiting our booth.
h. Surveyed attendees that signed up at the Boston Globe Travel Show in 2014 - We sent an email February 20, 2015 with a link to a survey to the 198 emails that had signed up at our booth the previous year. We received an 8% return (16 surveys). Again, the notable results (pdf attachment) included 44% stated they purchased a specialty crop (vegetables, fruit, honey, wine, flowers, maple) as a result of information on our website, map, or seasonal e-newsletter they received due to visiting our booth.

i. The significant contributions and role of project partners were the specialty crop growers who assisted us at the shows, giving out samples and then answering questions. It was a treat to the public to speak directly to growers. The goal was to educate on behalf of their grower associations

Goals and Outcomes Achieved:

Our original target of a 25% increase of e-subscribers was close to being met. We added another 1700 e-leads from March 2013 – through Dec 31, 2014 (for a total over 5060 emails from a benchmark of 4120 (19% increase)) as a result of attending the scheduled events, along with a number of additional events.

If we were to use pure attendance numbers of events we attended in the two years, we would estimate approximately 2.4 million people passed by our Massgrown Specialty Crop booth.

- AAA Marketplace = 18,000
- Boston Globe = 21,000
- Garlic Fest = 11,000
- Boston Flower Show – 60,000 attendees x 2 years = 120,000
- Eastern States Exposition – 1.4 million attendees @ 80% who walk by our booth for 2 years = 2,240,000
- Mt. Wachusett Apple Fest – 8,000 attendees x 2 = 16,000

If you add 2.4 million and the 723,000 readership of the Horizon publication, it put us over 3 million in general "impressions."

Google Analytics reported 149 direct clicks webpage statistics as a direct result of the AAA Horizon ad with unique website (Exhibit 3 www.Mass.gov/massgrown/aaa). We also received 570 information request cards from AAA in which we sent an ag-tourism map, recipe card and rack card with our website address.

Google Analytics also showed us all Massgrown related website pages statistics for the last four years:

Massgrown related webpages	Map	Total
• 2011: 274,360 pageviews	no data	
• 2012: 276,885	no data	
• 2013: 293,632	330,000	623,632
• 2014: 307,607	380,000	687,607

We compared survey results from the AAA Travel Marketplace to the Boston Globe Travel Show. The results were stronger from the AAA show, but still significant from the Globe Show. We feel the surveys show a direct link from the e-blasts to direct sales of Specialty crops. Combining the results from both surveys (53 survey responses out of 466 new e-subscribers):

- 94% visited out website based on an interaction with our booth
- 50% visited a farm using the website and map

- 76 farm visits as a result
- 71% purchased Specialty Crops
- 56% prompted visits to the website due to the e-blast
- 42% stated the emails initiated visits and/or purchases of Specialty Crops.

We are encouraged by the results. If we extrapolate these results to all that signed up for the e-blasts (466) from the two shows; and we use the 71% of those signed up, 332, might have purchased Specialty crops. Then if we estimate the Specialty Crop purchase of $10, $20, or $50, we could assume totals equaling $3,320, $6,640, $16,600 on Specialty Crops respectively. As a result of the two featured Trade Shows, and the other events we attended over the last 2 years, we've added 1700 emails. If you use the 1700 emails reading the e-blast newsletters, and 42% state they visits and/or purchase of Specialty Crops, this equals 714 purchases. Using the estimates of $10, $20, or $50, we could assume the addition of totals equaling $7140, $14,280, and $35,700 respectively. These numbers are only on those who signed up. It is a challenge to quantify those who took information from the booth and then visited our website or a farm directly (which we would expect a certain percentage to do). Using a conservative figure, we've handed out approximately a thousand brochures at each of the two featured shows, and then another two thousand from the other shows we attended over the two years of the project; we estimate 4000 at a minimum. If we use a low estimate, 10% of the 4000 spend $10, this equates to another $4000 in Specialty Crop purchases.

Going forward, we will continue to attend consumer events when feasible, add to our e-listserv, as we are pleased with the results gleaned from this project. We are also pleased with the collaborations with NE Apple Association, the MA Maple Association, and the MA Cranberry Association for their time and efforts in this project.

Work Plan:
December 2012 – January 2012:
Identify 2013 consumer events and register for them. Completed

January - March 2013:
Identify vendors for collateral development and production of Specialty Crop display and promotional materials - Completed
Coordinated logistics for AAA Travel Show and attended AAA Travel Show – Completed
Schedule and design advertising plan with Horizons Magazine – Completed

March – November 2013:
Developed seasonal e-blasts featuring Specialty Crops - Completed
Attend other consumer events and collect additional email subscribers - Completed

December 2013 – December 2014:
Develop and send out survey via email – Completed first survey.

January 2015 – December 2015:
Second survey - Completed February 20, 2015

Budget 12/1/2013

Supplies	Fuseideas	**Budget**	Booth Materials:	**Actual to date**
	Tradeshow Booth Display frame and artwork		1	$909.60
	Tablecloths (w/MassGrown logo)		2	$509.75
	Table cloth carrying case		2	$75.45
	Tattoos (tomato, broccoli, carrots)		5,000 each (15,000)	$814.50
	Rack Card (for MassGrown website)		30,000	$1,671.20
	Recipe Card (new design)		15,000	$1,785.60
	iPad and case		1	$558.95
	Account Service (Fuseideas)			$2,000.00
	Creative Service (Fuseideas)			$4,000.00
	Wufoo service for Ipad		$14.95 per month for 2	$29.90
			months	
	Apples/maple syrup samples			$371.75
	Maple samples			225.00
		$13,195.17		$12,726.70
Contractual	AAA Marketplace Trade Show (exhibitor fee)	$2,400		$2,225.00
	Boston Globe Travel Show Trade Show (exhibitor fee)	$3,150		$2,750.00
	AAA Horizons Advertisement (September Issue)	$3,350		$3,872.01
	Garlic and Arts Festival	$100		$100.00
	Totals	**$22,095.17**		**$21,898.71**

Beneficiaries:

The major beneficiaries are Massachusetts apple growers (339 per USDA), maple producers (267), and cranberry growers (over 400). This is based on the crops/products that were sampled at the two major consumer shows. But as we sent out seasonal emails, we also highlighted strawberries, flowers, and vegetables (another 2000 growers). With regards to potential economic impacts, see above results and extrapolation numbers.

Lessons Learned:

At the travel shows, we were surprised at the amount of interest in local food and farms. There seems to be a trend with consumers with an interest to know where there food comes from, and are willing to drive directly to the source (the farm). This was also reaffirmed in the number of people willing to give their personal emails to receive our monthly e-blasts highlighting the seasonal Specialty crops. The last item of surprise was the high percentages of survey responders that had visited a farm, and then purchased Specialty crops (71%). Based on these results we applied and received a SCBGP in 2014 to expand outreach to other targeted conferences to see if we see the same impact with a different target market audience.

Exhibit 1)

Exhibit 2)

Summer This is the time of the year when your senses will be delighted by an overwhelming assortment of fruits and vegetables in season. Your only challenge will be what to prepare next. This easy-to-make French dish was born as a use for the abundance of summer vegetables; serve it as a side dish or along with crusty bread.

"Farmers' Market" Ratatouille

Recipe variation from UMass Extension (Serves 4)

2 tablespoons of olive oil
1 medium red onion, chopped
2 cloves garlic, minced
1 small eggplant, any variety, peeled and cut into ½" cubes
1 red pepper, chopped
1 small summer squash (green or yellow), sliced in half moons
20 cherry tomatoes, halved
2 tablespoons of fresh basil, chopped
Pinch each of salt & ground black pepper

In a large nonstick sauté pan heat olive oil over medium heat
Add onion and sauté until soft, about 10 minutes
Add garlic and sauté for another minute until soft
Add eggplant, red pepper, and squash
Cover and cook for about 10 minutes or until vegetables are soft
Add tomatoes and basil, reduce heat to low, and cook for about 5 minutes longer
Season with salt and ground black pepper

Fall Nothing is more delicious than a crisp, sweet-tart apple grown in Massachusetts. Its unique, complex flavor is a product of the region's long, hot summers and crisp fall days. About 40 varieties of apples are grown on family-owned orchards, an important community resource that adds to our quality of life while preserving open spaces.

Apple Crisp

Recipe from *America's Apple* Russell Steven Powell (Serves 10)

Filling

6 Massachusetts apples, like Northern Spy or McIntosh, cored and sliced
¼ cup granulated sugar
2 tablespoons of lemon juice
1 teaspoon of cinnamon
¼ teaspoon of nutmeg
¼ teaspoon of salt

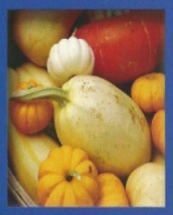
Topping

¾ cup of whole wheat flour, sifted
½ cup of old-fashioned oats (not quick-cooking)
¼ cup of brown sugar or maple syrup
5 tablespoons of butter (plus some for greasing baking dish)

Preheat oven to 350°F
In a bowl, mix together apples, sugar, lemon juice and spices
Grease a 2-quart baking dish with butter
In another bowl, combine topping ingredients and mix until it is the texture of coarse meal
Add apples to buttered baking dish & cover with topping
Place baking dish on a cookie sheet, bake uncovered for 45 minutes or until apples are soft

Massachusetts Grown Products...

Always in Season!



Seasonal Recipes

Massachusetts grown...and fresher!™

Exhibit 3)

Autumn in the Adirondack's is feast for senses

By Dana Hammond

Mother Nature has her cathedrals, and hiking through a sun-shafted forest in fall is enough to turn anybody into a believer. In the Adirondacks, clear autumn light makes the canopy glow like a stained-glass window. Crest one of the area's mountaintops and marvel over more color cascading across the landscape.

Autumn in the Adirondacks promises the longest viewing period for foliage in the Northeast. Color tiptoes in during late August on the highest peaks, and by mid-October it's tumbling down mountainsides and twirling around shorelines. One of the first Forever Wild forest preserves, Adirondack Park sprawls across 6 million acres in nearby New York, making it the largest protected parkland in the lower 48 states as well as the largest National Historic Landmark. To fathom its expanse, consider the fact that it covers more area than Yellowstone, Yosemite and the Great Smoky Mountains national parks combined.

The park cradles nearly 50 peaks above 4,000 feet, more than 1,200 miles of rivers and at least 3,000 brilliantly ubiquitous lakes, but you won't find an official entrance. Here, wilderness has always co-existed with quaint pockets of civilization. For a quick getaway, the southern Adirondacks and its centerpiece, Lake George, beckon. Famed for pristine waters and forested shores, this narrow body has been dubbed the Queen of American Lakes. If that's the case, surely the Sagamore Resort is a gem in the queen's crown. A grand hotel clad in classic white clapboard and green shutters, the Sagamore has been welcoming guests since the 1800s. Fittingly, it's another landmark on the National Register of Historic Places.


VisitLakeGeorge.com

The resort rests on a secluded island near "The Narrows," a section of the lake freckled with islands you can paddle to on kayak or survey from a replica 19th-century touring boat the Sagamore operates. When autumn sets the horizon on fire with foliage, you'll be tempted to just roost at the resort and gawk at nature from this gilded perch.

Imagine living inside a landscape painter's dream vista: the marshmallow-white historic hotel, the sapphire lake and the traffic-light colors of autumn all around. Lakeside dining keeps the scenery in sight and so does a round of golf on the resort's 18-hole course, built by legendary designer Donald Ross in 1928. A sublime, lakefront infinity pool along with a large warming pool were added recently, and the resort even boasts an indoor pool with lake views. You can fish from an onsite dock, snuggle up to an outdoor fire pit or just melt into an Adirondack chair.

The Sagamore can arrange guided hikes, but the nearby Cat and Thomas Mountains Preserve offers one of the best experiences in the area. Well-marked trails traverse old logging roads and wooded paths, skirting wetlands and beaver ponds, before summiting to showcase Lake George. For another worthwhile excursion, hike or drive up Prospect Mountain. The popular drive unfolds along Veterans Memorial Highway, a 5-mile route with scenic overlooks. At the top, "100-mile view" extends across the lake to Vermont, New Hampshire and Canada's Laurentians. The bucolic Warren County Bikeway, which begins at Battlefield Park on the southern tip of Lake George, provides a nice outing as well. Signposts along the way shed light on the region's history. Touring Fort William Henry, a British outpost during the French and Indian War, adds further insight.


Darren McGee

Left, Adirondack chairs face a colorful mountainside. Above, balloons take to the skies at a festival in Queensbury.

Mountain biking trails crisscross Gore Mountain, where leisurely leaf-peeping via gondola also lures visitors. The basket of a hot air balloon, however, probably rates as the most effortless way to survey swaths of scenery. Vendors are easy to find, and every September the vibrant Adirondack Balloon Festival takes flight minutes from Lake George in Queensbury.

Seasonal events bring lots of flavor. You'll find everything from Jazz at the Lake, which marks its 30th anniversary this month, to the World's Largest Garage Sale. The latter takes place in Warrensburg, an enclave of antique shops and home to the quaint Grist Mill on the Schroon restaurant.

Still, everything comes back to nature in the Adirondacks. It's inescapable, whether wandering the waterfront of Lake George or hiking in the forest. The Adirondacks promise organic beauty and seasonal scenes that stir the senses. You'll smell wood-burning fires, feel crisp mountain air, see foliage saturated with color and, inevitably, hear your own heart pounding.

In Your Backyard

Tougas Farm has all-day activities

By Julia Quinn-Szcesuil

September brings the wonderful harvest of juicy end-of-summer fruits and vegetables while ushering in the apple and pumpkin season that so many New Englanders eagerly await. Tougas Farm in Northborough offers an extensive pick-your-own operation, but there's enough to do on the farm to make all ages happy. In between choosing the best peaches or apples to bring home (or even last-of-the-year berries), visitors find the playground and petting zoo great kid-pleasers, too.

"We are a family business, and we pride ourselves on having the best fruit out there," said Andre Tougas, co-owner of the farm. Family members help run the farm and enjoy talking to visitors, who come from all over. Tougas' staff strives to make visits both fun and educational, with information available all around the farm.

The late summer to early fall season means that early apples like McIntosh, Gala and Blondies, a new yellow apple, are ready for picking. Early in the month, the last of the summer peaches are still available as well. You might even find some blueberries and raspberries to take home. One of the popular options is the apple/peach pick-your-own combo box, said Tougas, where you can get a little of each fruit in one box (Tougas advises putting heavy apples on the bottom). As the month progresses, Honey Crisp apples come into season, and the pumpkins' orange color signals they are ready for picking.


Tougas Farm

Children enjoy freshly picked apples at Tougas Farm.

On weekends, a wagon ride to the orchards is an event in itself, but the ride also saves pickers the hike back with pounds of fruit. Picnic tables and benches give a place to rest before heading to another activity – like the playground, complete with climbing rocks and swings.

In addition to celebrating apple flavors with cider slushes, apple cinnamon coffeecake and apple crisp, the ever-popular cider doughnut is a hit. The newest addition to Tougas Farm is the building where visitors can watch doughnuts being made and then buy a bag to bring home.

Tougas Farm, 234 Ball St., Northborough: 508-393-6406 (picking information line) www.tougasfarm.com. To read about more places to pick your own fruit, go to AAA.com/Horizons.

Exhibit 4)

March is Maple Month!

Don't let the snow keep you from celebrating our most precious crop of the season; March is the month to feast on pure **Massachusetts Maple Syrup**. Our maple producers have cooked up a variety of sweet farm-to-table events that are fun for the whole family!

ALL DURING THE MONTH OF MONTH: Visit maple sugarhouses to sample syrup and learn about the sweet process. For sugarhouse locations and hours go to www.massmaple.org.

Massachusetts Maple Recipe Contest

Think beyond the pancake and submit your favorite maple recipe! This delicious, all-natural sweetener is not just for pancakes. It can be used in many sweet & savory dishes too! Contestants must submit entries by Friday, March 14 at midnight. The contest will be held at Williams Sugarhouse at 7:00 pm on Tuesday, March 18. Contestants will bring their dish to the event to be tasted by a panel of expert judges who will choose the winner.

- **Friday, March 7** - Maple Magic - Drumlin Farm Wildlife Sanctuary, 3:30 pm - 5:00 pm, 208 South Great Road, Lincoln

It's Maple Sugaring Time! Visit the maple grove to check out the taps and taste some sap. Hear about some traditional ways of making this sweet treat and compare that with today's methods. Listen to stories of the first sugar makers and delight your taste buds with a sweet maple treat.

- Saturday, March 15 - 1st Annual Appleton Farms Maple Festival, 10:00 am – 2:00 pm, 219 County Road/Route 1A, Ipswich

Discover the process of maple sugaring, from tap to table, as you tour Appleton Farms sugar maple stands and sugar shack. This community-friendly event includes activities fun for all ages.

- **Saturday, March 22 & Sunday, March 23** - 1st Annual Massachusetts Maple Weekend

The Massachusetts Maple Producers Association is sponsoring a weekend full of maple madness! Dine at any of the 30 participating restaurants and 40 participation sugarhouses over the weekend and enjoy the sweetness of pure Massachusetts Maple Syrup while supporting local farmers.

- **Monday, March 24** - Berkshire Grown Maple Dinner – 6:00 pm, Cranwell Resort, Spa and Golf Club, 55 Lee Road/route 20, Lenox

A benefit for Berkshire Grown & Share the Bounty that celebrates the first harvest of the season with a maple-licious five-course dinner created by a team of exceptional chefs from throughout the Berkshires.

Maple Weekend Blog

You can even **find Massachusetts Maple** in some **craft beer** made in the state! Check out the new Massachusetts Craft Brewers Passport program. To see which craft brewers use maple syrup, click on Brewer local ingredient usage page (.pdf).

You can always find an ongoing list of culinary and agricultural events across Massachusetts at www.mass.gov/agr/massgrown/calendar.htm, and follow us on Twitter @Massgrown.

Exhibit 5) www.Mass.gov/Massgrown - March 2014 (screenshot)

Exhibit 6)

Thank you stopping by the MassGrown booth at last year's AAA Travel Marketplace at Gillette Stadium, and for subscribing to our ***MassGrown & Fresher*** e-newsletter at the AAA Travel Show last year. We hope you remember visiting our booth and savoring a locally grown McIntosh apple or a delicious piece of maple candy! We offered a variety of Ag-tourism materials to help keep you up-to-date with farm and food activities found all over the Commonwealth.

Please take a minute to help us with our short online survey.

To thank you for your time, we'll send you a free copy of our beautiful *2014 Celebrating the Seasons of Massachusetts Agriculture* calendar.

Sincerely,

Rick LeBlanc

Massachusetts grown...and fresher!™

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Organization: Community Involved in Sustaining Agriculture (CISA)

Project Title: Marketing Specialty Crops a Monthly Campaign to Grow Supply and Drive Sales

FY 2012 12-25-B-1467

Final Report

1. Project Summary

CISA and our partners sought funding to increase consumption of specialty crops, thus increasing sales and enhancing economic development. This project made it possible to directly target consumers with marketing and outreach to increase demand for specialty crops and provide support to farmers and wholesale buyers to increase supply of specialty crops.

CISA and our fellow Buy Local organizations have had tremendous success in creating demand for specialty crops. Over the last fifteen years of our "*Be a Local Hero- Buy Locally Grown Campaign"*®, we have focused the public's attention on locally grown specialty crops, and we have been able to mobilize 'innovators' and 'early adopters' – the people who were able to take on a greater risk and were more educated about the importance of buying local specialty crops. Even when the worst recession since the Great Depression hit the Commonwealth in 2008, Buy Locals supported continued direct sales by reaching these innovators and early adopters. In part due to the efforts of the Buy Locals we have more production and more public attention on local specialty crops because of their freshness, their health benefits and the public's desire to support local farmers. We know through anecdotal information and research we conduct in western Massachusetts that more farmers are selling direct to the public.

When we applied for this grant CISA had learned that for many farmers, consumer demand was not keeping pace. For example, the number of farmers' markets increased 55% from 29 to 45 in just two years, but for the first time we were hearing from some farmer vendors that supply was greater than demand and there was a 'glut' of farmers' markets. Regarding CSAs, we knew that the three counties of Franklin, Hampshire, and Hampden boasted 52 CSAs, but that there was more widespread concern from CSAs about selling all their shares and some farms even started to pay for advertising.

In 2012, we were at a turning point: if we did not reach the next level of potential consumers, we were concerned that the hard earned gains of the past 15 years would stagnant and perhaps even recede. We needed now to reach individuals who make up the 'early majority' of the public.

These people take significantly longer than the innovators and early adopters to make a change in their buying habits. This is a much greater portion of the public and critical to the expansion of local specialty crop producers.

Our project reached the 'early majority' through three strategies. One, we launched a new campaign to highlight two specialty crops a month through traditional and social media. Two, we encouraged innovators and early adopters to speak out on behalf of local specialty crops by directly 'inviting' their friends, people who could constitute the early majority, to join them into the movement of buying locally grown specialty crops and by voicing their support for local specialty products where they shop, thus increasing demand for local products. And three, we worked with retailers, restaurateurs and others to increase sourcing of local specialty crops. We believed that the more consumers who were aware and thinking about local specialty crops (wherever they shopped), the more opportunities there would be for specialty crop farmers- either because more wholesale options would work for farmers and/or because more consumers would cross-over to direct markets.

We built on previous specialty crop block grant work by continuing and strengthening active partnerships with other Buy Local organizations in the state. Through this proposal CISA, Northeast Harvest, and Berkshire Grown collaborated directly on the specialty crop campaign. In addition our campaign materials and outreach we built on research completed and outreach material developed in 2011 about specific specialty crops. Finally, the list of specialty crops chosen for promotion was developed based on farmer need as determined through research completed for the Boston Public Market shared stand and in collaboration with MDAR and the MA Farm to School Program.

2. Project Approach

CISA and our partners worked to focus the public's awareness specialty crops this grant. Our efforts provided practical information about purchasing and eating specialty crops throughout the year. Together we highlighted 28 crops over 15 months using a combination of paid advertising, Facebook, earned or unpaid traditional media and we provided farmers with direct assistance in expanding sales of specialty crops through workshops and one-on-on outreach. Our efforts supported sales at specialty crops both through direct channels

Activities performed

Month	Tasks	Updates
By December 2012	-Finalize specialty crop list with partners	A crop list was developed early on in the project with input from the MA Farm to School Project and others. However our final crops for spring 2014 needed to be adjusted based on actual availability. We were planning on highlighting parsnips in March 2014, but they were not available in large enough quantities to widely promote (spring parsnips were dug in April this year!)
	-Develop templates for consumer outreach materials	Because consumer outreach happened through different mediums for different organizations, we agreed a formal template would be unwieldy. Instead we agreed on the tone and message of our outreach.
	-Reach out to farmers and buyers to make them aware of effort and offer assistance	We sent out an email to all farmers and buyers and made follow up calls with farmers and buyers who we knew produced or offered our identified specialty crops. In addition to the blanket outreach we did at the beginning of this grant, we also communicated with farmers and buyers on a monthly basis to remind them of each months highlighted specialty crops.
January-December 2013		Due the timing of CISA's final award and a review of the crop list, CISA launched our 2 a month public campaign with a "soft" effort in April 2013 and a full launch in May 2013, we continued promotions for a full 12 months into spring 2014.
	-Run monthly media campaign: • Feature crops in email newsletters	Email newsletters, and Facebook have included featured specialty crops (See samples attached.) Earned media promotes specialty

	• Feature crops in earned media	crops. The Daily Hampshire Gazette features a short column written by CISA featuring each of our featured products. The print column is then redirected to CISAs webpage for more information and promoted on Facebook.
	• Feature select crops in paid media (May, July, November)	Northeast Harvest ran ads in November 2012, May 2013 and July 2013. (See attached).
	-Run community engagement effort with social media	CISA and Berkshire Grown promoted specialty crops monthly via Facebook. We also encouraged community members to follow up with retailers in our community to encourage them to buy local through the creation of a special volunteer group. Unfortunately only two people volunteered to do this and neither was consistent at getting data back to us about their findings.
	-Provide support to farmers, buyers • Host panel workshops (Jan, Feb, March)	Berkshire Grown hosted three panel workshops: 1) February 25: Opportunities for Value-Added Processing for Berkshire County Farmers 2) March 11: How Food Businesses Can Help Farms Expand Through Product Aggregation and Distribution 3) April 8: Farm to Institution: Facilitating Relationships to Get More Locally Produced Food Into Cafeterias
	• Provide information via email newsletters and website to buyers/farmers	All partners provided information to farmers and buyers about the program and to support new/growing sales.

	• Be available for one-on-one	CISA has been available to support growers and buyers 1:1. We were directly in touch with 90 growers throughout the grant and contact 29 buyers interested in our current specialty crops at least once a month over a 13 month period.
	- Collect website hits, email clicks, community member feedback, and other data on campaign effort	Data collection continued throughout the campaign (see also goals/targets below).
December 2013	-Develop evaluation material for farmers, buyers	CISA included questions relevant to this work on our year-end survey for farmers and buyers and made follow up phone calls. We shared the evaluation tools we developed with our partners. (See also goals/targets section).
January 2014-March 2014	-Collect evaluation data, Analyze results and formulate recommendations	Evaluation data was collected in the spring and analyzed. In the lessons learned section, we include future recommendations based our efforts implementing this program.
	- Hold final phone conference	CISA and our partners debriefed with a final call and email communication to wrap up the grant.

Project Partners

Although the aim of our collaboration was the same, CISA and partners on this grant contributed to the activities in different ways, depending on the needs of their community. Below is a summary of the contributions and roles of project partners:

New England Fruit and Vegetable Growers: advised on the featured crops list.

MA Farm to School: Coordinated on the featured crops list development to maximize overlap between CISA's list and MA Farm to School's efforts.

Northeast Harvest: Produced and aired radio ads to promote specialty crops and featured specialty crops in monthly email newsletter. Reached out to specialty crop farmers to assist them in increasing sales of local specialty crops. Northeast Harvest is the youngest Buy Local

campaign we worked with and as a result has a smaller base of supporters on their social media (50 Facebook likes, 500 website hits) so it made sense to use paid media to reach a broader audience (WBZ-AM has 800,000 listeners a week) with the specialty crop messages. Northeast Harvest's email list was more robust with nearly 2000 email addresses in 2013, so Northeast Harvest included email newsletter eblasts as part of this campaign.

Berkshire Grown: Used social media to promote specialty crops. Developed and ran three workshops designed for specialty crop farmers, to assist them in expanding sales of specialty crops Reached out to specialty crop farmers to assist them in increasing sales of local specialty crops. Berkshire Grown has a strong social media presence and so primarily used Facebook to promote specialty crops (over 2,000 likes) to consumers. Berkshire Grown area farmers, however, tend to be much smaller than the other regions covered by this campaign and needed additional training and education to increase their sales – so Berkshire Grown offered specialty crop farmers workshops to enhance farmers' ability to increase sales, as well as direct support.

3. Goals and Outcomes Achieved

Our two goals were to 1) Increase income for specialty crop producers in participating counties and 2) to increase consumer awareness of specialty crops.

Performance Measure	Benchmark	Target	Data Collection Plan	Actual Data	Notes
Goal: Increase income for specialty crop producers in participating counties. During the timeframe of this work 66% of specialty crop producers reported an increase in sales from the previous year.					
Value of specialty crop sales in participating counties.	In 2007, specialty crop producer in participating counties had $147 million in sales ($147,209,000).	Increase sales by 3% to $151,625,000.	Review of 2012 NASS Ag Census, available in 2014.		*Because of the delay in launching this project only one radio campaign started in 2012, so the data from 2012 NASS does not reflect the impact of our project on specialty crop

					producers.
Number of farmers who see an increase in sales over 2011 figures.	46% of specialty crop farmers who responded to CISA's 2011 year end survey said sales increased from the previous year.	54% of farmers will report an increase in sales from 2011.	CISA's year-end survey completed in March 2013, data available in May, 2013.	66% of farmers reported an increase in sales in 2013, the year this campaign was run. (In 2013 80 specialty crop producers responded to this survey, and in 2011 72 specialty producers responded to the survey).	Because of the delay in launching this program we looked at data from the 2013 year-end surveys to assess impact. The baseline originally included in the proposal was 30%- but on recalculation, we realized that number was inaccurate. We have updated the baseline to reflect the correct calculation and adjusted the target to reflect an equivalent % gain in the number of farmers reporting an increase in sales.
Goal: Increase in consumer awareness of specialty crops During the course of this work we generated over 24,000 social media impressions with local consumers and a 2.9% engagement rate. We also reached consumers through traditional media that reached up to					

815,000 people a week.					
Number of people who access information about specialty crops through social media sources.	We will be putting up new specialty crop information through this project through various channels and don't have a benchmark for how many people currently access information about specialty crops but currently we know the number of people that use our material.	5000 people exposed to information about specialty crops, 2% actively engage with specialty crop information.	Website traffic, click-through from email newsletters, and Facebook impressions and activity will be tracked monthly.	This campaign had at least 24,908 impressions through social media (including websites). At least 2.9% of Facebook impressions actively engaged with CISA. For instance the "reach" on our Facebook post about our blueberry pick-your-own list was 1183 with 72 people liking or sharing the post.	Our baseline data underestimated the growth in social media between 2011 and 2013 and as a result CISA and our partners were able to reach significantly more people than we originally expected.
	1265 people open CISA's email newsletter. Northeast Harvest's email newsletter is sent out to around 1750 people.			CISA's email newsletter grew to 5237 since our proposal and the number of people who opened our March, 2014 email was 1493. Northeast Harvest newsletter grew to 2075 people.	

	2865 unique visitors to CISA's website in May 2012.			4,585 unique visitors to CISA's website in March, 2014.	
	1254 Facebook "likes". Berkshire Grown had just over 1700 like in 2011.			CISA's Facebook "likes" went from 1889 to 2557 during this grant, Berkshire Grown grew to 2258 likes.	

4. **Beneficiaries**

This project impacted farmers and consumers throughout most of the Commonwealth. Our efforts reached the counties of Berkshire, Essex, Franklin, Hampshire, Hampden, and Middlesex. We estimate that this benefitted over 2,127 farmers in participating counties who grow specialty crops (2007 NASS Census data).

Farmers who grew highlighted crops (apples, asparagus, beans, bedding plants, beets, blueberries, cabbage, carrots, Christmas trees, spring greens, herbs, honey, kale, head lettuce, maple syrup, onions, peaches, peas, peppers, potatoes, pumpkins, raspberries, sprouts, strawberries, summer squash, sweet corn, tomatoes, and winter squash) were the primary beneficiaries.

Additional beneficiaries include consumers (both children and adults), who gained additional nutritional knowledge and will increase consumption of specialty crops, and sellers of specialty crops, such as retailers and restaurants.

5**. Lessons Learned**

1. We wrote this proposal in such a way as to allow our different partners to implement the campaign in different methods, which was critical to the success. The current awareness about local specialty crops among consumers, the current expertise of specialty crop farmers in marketing their product, and the levels of engagement our partners had with their community members all varied. This meant tailoring the campaign to each community was critical. The section above on partners provides some of the basic information about how and why we choose to implement certain aspects of the campaign in different ways.
2. Media that includes specific farms (such as interviews and profiles) or specific actions (such as pick-your-own lists) gets greater "engagement" and "reach" using social media. These posts are most likely to be liked, shared, or clicked. The material has to be interesting and actionable, but it cannot be too involved or people will not engage either. For instance, the opportunity to volunteer with CISA to follow up with retailers did not have much engagement.
3. We reached out to encourage retailers to source our designated crops locally and worked to connect them directly to wholesale growers. We found that demand and supply for many specialty crops are mismatched – for products that retailers want (e.g. asparagus) there are few growers interested in selling wholesale, while growers have supplies of crops (e.g. onions) that retailers have not been interested in purchasing. It is clear from this outreach that farmers need more support in addressing the unique challenges of successful direct wholesale sales and that retailers need more convincing to purchase local products and more support in finding a good supplier match for local specialty crops.
4. Regular communication with buyers and retailers was important to build relationships and keep partners engaged. Two of our retail partners used our two a month campaign in their own outreach to consumers (via in store displays or flyers) and that required consistent effort on our staff's part keeping the buyers up to speed on product availability and producers as each month came.

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