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Project Title: Capacity building for Ohio Beekeepers

Project Summary

When this grant was originally approved, the Ohio State Beekeepers Association (OSBA) partnered with Crossroads Resource Conservation and Development Council (Crossroads RC&D) and The Ohio State University (OARDC Bee Lab and OSU IT department). Over the course of time, the Crossroads organization was dissolved and the participating Ohio State staff retired. Subsequently, the Ohio Produce Growers & Marketers Association was asked by the Ohio Department of Agriculture to assume grant management and support OSBA's efforts. While the project was ultimately completed on-time, activities during the funding period were delayed due to the change with oversight.

According to Ohio Department of Agriculture (ODA) records, bee colonies have alarmingly dropped from around 115,000 in 1965 to close to 15,000 in 2007. ODA also reports the number of beekeepers in Ohio fell from 12,000 to about 4,000 over the past 30 years. This threatens the ability to respond to pollination needs in the state. Since then, rapid urbanization, killer bees, harsh weather and small hive beetles all have added stress to honeybees. Bees are critical pollinators for Ohio fruits and vegetables providing a value of $86 million. Each beekeeper is contributing an estimate of $26,000 per year and each colony is contributing about $1200 to $2400 the Ohio State University.

Just as important to this current threat, is the future threat of Africanized colonies and their effect on queen bee production. According to Dr. Dewey Caron, the best models of where Africanized bees will show up directly correspond to the current centers of queen bee production in the U.S. Ohio is in a region where these bees are not expected to readily adapt, providing an excellent opportunity for Ohio to fill the gap for future queen bee production for the country.

The goal of the project was primarily to increase the skills and knowledge of Ohio's beekeepers. There were four key initiatives:

1. Develop and conduct workshops for people interested in raising queen bees.
2. Conduct a survey among beginners to better understand their needs.
3. Develop a web-based training program for beginning and intermediate beekeepers.
4. Increase capacity to provide online resources and interchange among beekeepers.

This program was important because it supported a cottage industry that has an economic impact. Furthermore, there was a demand for superior queen bees and hives to support Ohio's agriculture.

This is a first-ever project of this type for the organization and believed to be a model for other state-based organizations.

Project Approach

The program was largely volunteer-led by members of the OSBA. The core activities for the volunteers and contractors included:

- Production of instructional videos to be posted on the OSBA website.
- Development of additional instructional and complementary materials such as PowerPoint training presentations.
- Marketing and other outreach to current beekeepers, farmers, and others interested in becoming beekeepers and/or supporting those businesses.

The instructional materials were designed for the novice beekeeper and covered such topics as basic equipment, assembling equipment, installing a package, dealing with a laying worker, re-queening, replacing equipment, etc.

Project Timeline:

1st Quarter 2011: Volunteers conducted regular update conferences; began development of web-based training materials; continued OSBA website development; began outreach to OSBA members and state clubs; and Crossroads RC&D ceased operations.

2nd Quarter 2012: OPGMA assumed management responsibilities; volunteers conducted regular update conferences; continued production of web-based training materials including videos; site and material evaluations; and promotion to beekeepers and other stakeholders.

3rd Quarter 2012: Volunteers conducted regular update conferences; continued production of web-based training material; continue posting of material to OSBA website; promotion to beekeepers and other stakeholders, including development of marketing materials; began production of supplemental learning materials.

4th Quarter 2012: Completed filming and editing of videos; completed web development including posting of videos and supplemental learning materials; continued promotion to beekeepers and other stakeholders.

Goals & Outcomes Achieved

It's not possible to measure the exact number of new beekeepers that have organized but we do know the following. OSBA's network includes nearly 3,000 (of the registered ~4,300) beekeepers, which represents more than 30,000 bee colonies (according to ODA). This has directed numerous people to the website resulting in more than 29,000 video downloads and more than 80 DVD versions have been distributed. Also, nearly 40 beekeeping clubs are believed to be using the materials for their educational activities along with at least 50 queen bee breeders, which were not in the original scope of the project's audience. Furthermore, several over state beekeepers associations have requested and been granted permission to directly use the materials and/or link to OSBA's website. Additionally, through our outreach efforts, many produce and vegetable producers are now using OSBA's services.

As stated in the summary, the goal of the project was primarily to increase the skills and knowledge of Ohio's beekeepers by providing needed technical resource. There were four key initiatives:

1. Develop and conduct workshops for people interested in raising queen bees.
   Accomplished: Workshops were conducted at OSBA meetings.

2. Conduct a survey among beginners to better understand their needs.

   Accomplished: In the early part of the program, beekeepers were surveyed for suggested instructional topics and gaps in skills.

3. Develop a web-based training program for beginning and intermediate beekeepers.

   Accomplished: A web page (www.ohiostatebeekeepers.org/beekeeping_class) was added to the OSBA website and it includes 34 (originally planned for 25) instructional videos and three PowerPoint presentations.

4. Increase capacity to provide online resources and interchange among beekeepers.

   Accomplished: Beyond the materials developed, the program facilitated opportunities for beekeepers to hold educational programs and do outreach to Ohio's farmers (primarily fruit and vegetable growers).

The instructional materials included the following video subjects:

1. Assembling Hive Equipment
2. Frame Assembly
3. Branding Wooden Equipment
4. Lighting a Smoker
5. Spring Bee Flight
6. Spring Management Part 1
7. Spring Management Part 2
8. Spring Management Part 3
9. Spring Management Part 4
10. Correcting a Cross-Comb Colony
11. Refurbishing Hive Equipment
12. Evaluating a Queen's Performance Part 1 (Determining the need for a new queen)
13. Evaluating a Queen's Performance Part 2 (Stabilizing the weakened colony until a queen can be purchased.)
14. Evaluating a Queen's Performance Part 3 (Installing the new queen)
15. Evaluating A Queen's Performance Part 4 (Checking the new queen release procedure)
16. Package Bees Part 1 (Preparing the hive and the queen)
17. Package Bees Part 2 (Releasing the bees)
18. Hiving a Swarm (From beneath the screen bottom board)
19. Hiving Three Swarms (Three swarms found in three different situations)
20. Laying Workers Part 1 (How to combine it with another colony)

21. Laying Workers Part 2 (Combining a laying worker colony with a queen-right nucleus colony)
22. A Quick View of a Propolis Forager
23. Water Foragers
24. Moving Two Bee Colonies
25. An Introduction to Wintering Biology
26. Basic Hive Equipment
27. Feeders Part 1
28. Feeders Part 2
29. Hive Supers
30. Preparing Colonies for Winter
31. Protective Equipment
32. Specialty Beehive Equipment
33. Transferring Bees Part 1
34. Transferring Bees Part 2

Additional materials included several PowerPoint presentations:

1. Honey Bees and Parasitic Mites – A Historic Review with Some Control Suggestions
2. Commercial Pollination
3. The Dynamics of Pollination

Beneficiaries

The beneficiaries of this effort were Ohio's current and new beekeepers, and the agriculture community that requires the services of pollinating bees. As outlined in the Goals & Outcomes section, thousands of beekeepers and hundreds of agriculture producers are using the resources.

The beneficiaries of this effort were Ohio's beekeepers and the agriculture community that requires the services of pollinating bees.

Lessons Learned

The main lesson learned was that breaking down beekeeping into teachable segments required more work than expected. In other words, many of the beekeeping activities come "naturally" to experienced beekeepers therefore documenting each step for a novice audience was challenging. This in fact expanded the final products (i.e., more videos produced than planned) but they were necessary. Despite years of practice, teaching the skills is much more involved than originally assumed.

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Additional Materials
See brochure attached.

Project Title: Connecting beginning, urban, minority specialty crop growers with markets

The following information describes the results of the project coordinated by CIFT in which the objective was to conduct a pilot project utilizing produce grown in an urban setting to teach new specialty crop producers the techniques, practices, and procedures that are required when selling products through purchasing establishments. The efforts identified issues and provided a path for determination of solutions for increased local food system development.

Project Summary
The increased interest in urban agriculture was the inspiration for this initiative. Community based efforts with the goal of establishing an economically and environmentally sustainable food production and distribution system that will be an engine for the creation of business enterprises, healthy foods, and jobs within urban communities is the focus. As the intensity elevated from the production aspect, it was imperative to address post harvest guidelines that would enable product to flow into the marketplace. Numerous businesses expressed interest in procuring the product but the outlets generating the produce needed additional information on procedures, techniques, and strategies for successful engagement. The focus of the effort was to engage urban growers with a variety of customers while also assisting in the determination of appropriate growing techniques for increased production capacity.

Project Approach

Due to the limited product available and the operational model of Chariott Foods, it was not feasible to incorporate the minimal produce into their established distribution channel without disruption to business. Therefore, in order to place proper emphasis on this critical component of the overall system, an alternative approach was applied. CIFT, in conjunction with the Agricultural Incubator Foundation, manages a kitchen incubator facility for value-added processing as well as an IQF freezing component for produce. The venue allows for collection, sorting, washing, preparing, minimally processing, and packaging of produce. Equally, a truck was purchased to transport product to various outlets either for storage or later consumption and further distribution. This resource was utilized for the envisioned role in which Chariott Foods would have participated. As quantities increase and product is more substantial, Chariott Foods can serve as the outpost for processing and distribution. Until that time, an alternative was applied in order to gain insights on the entire food system.

Project staff did not use SCBGP funds to solicit donations. The statement was to further explain how product is utilized when grown within urban settings. The Center of Hope, Fernwood Growing Center, and numerous others within the city are dedicated to serving

their neighborhoods and enhancing the community through fresh produce. That is typically the goal for establishment of any type of growing practice for fresh produce. This project was to encourage a sustainable and more impactful approach through market penetration. The amount of product available for sale was limited due to a portion of the product being applied to social efforts. This was determined by each host location independently.

Program staff provided technical assistance in the operation of various techniques for urban food production, identified contacts for procurement of produce grown within these outlets, educated managers on how to maintain a sustainable operation, assisted with increased production of product within urban settings, and evaluated consumer feedback.

Due to proximity of the growers associated with this project, alternative techniques were presented to ensure the most appropriate approach was utilized. In many cases, the first step was to demonstrate that each methodology would provide fresh fruits and vegetables in an economical fashion within the urban area. Two outlets were tapped to demonstrate various applications i.e. hoop house and hydroponic vertical systems. To compliment the physical observation of the techniques, a guide was created to highlight the considerations for hoop house, vertical system, grow Soxx, and raised bed production practices. Finally, after successful production has been achieved, understanding of the market is necessary for sustainable practices. Many within the urban setting are focused on donations for community enhancement and neighborhood engagement. However, they quickly realized that a portion needs to be involved with sales in order to obtain plants, nutrients, and various materials for the following growing season. Assistance was provided through this initiative to gain increased understanding of buyer and seller relationships.

Hoop House at Center of Hope Baptist Church; Toledo, Ohio

Hydroponic Vertical System at Fernwood Growing Center; Toledo

Goals & Outcomes Achieved

The outcomes emanating from this initiative are both short and long term. Activities associated with each component of the project are highlighted below to further demonstrate the outcomes achieved.

Demonstrate that novel growing systems can provide fresh fruits and vegetables on an economically sustainable basis.
Presentations were conducted in Toledo, Columbus, Cleveland, and Wilmington, Ohio to educate growers and community organizations how to establish a local food system and various production techniques to consider for inclusion. Each location was co-sponsored by an organization ranging from the Toledo Botanical Gardens, Economic and Community Development Institute, Cleveland-Cuyahoga County Food Policy Coalition, and Wilmington College/Grow Food Grow Hope Initiative.

As mentioned throughout this project, the Center of Hope location experienced significant delays in construction of the hoop house and therefore had no product available for inclusion in this project. However, Fernwood Growing Center was connected to the Toledo Farmers Market, the Community Market which is the neighborhood store, Pam's Corner a local restaurant interested in fresh items, and a broker connected to various foodservice venues. The results of these connections are referenced within the final report in terms of revenue potential. Not all of the indicated outlets mentioned above were pursued due to limited available product. Fernwood Growing Center experienced some plant stress from the weather coupled with the lack of any product from Center of Hope, thereby limiting the ability to explore larger contracts such as schools, distributors and food processors.

Partner organizations, Center of Hope and Fernwood Growing Center, served as demonstration outlets. Center of Hope, however, experienced significant delays in production due to permits impacting construction of the system. Therefore, other outlets were tapped for product to include in the project. Fernwood Growing Center incorporated 1,000 strawberry plants into a hydroponic vertical system while a second unit incorporated various vegetables. More than 30 growers implemented a version of the techniques in various locations around Toledo. The majority of these outlets participated in training sessions and communications associated with the advancement of the local food system. There were at least 30 attendees (20 attendees was our goal) at each of the four locations where training efforts were conducted. The expectation of limited awareness outside of the Toledo area was proven accurate, therefore, more time was allotted for general information on growing techniques during those sessions. Several were too small to engage in the buyer relationships and equally that was not their ultimate desire. However, the larger ones did connect with buyers resulting in sales. Information uncovered through this effort was shared with groups in other urban epicenters to further encourage local food system development.

Establish a guide to identify and train agri-entrepreneurs and demonstrate the value and feasibility of agriculture as a primary or supplemental income producer.
The first point of consideration was how to grow produce within the defined space allotments and resources available. A portfolio was created to highlight the considerations, both positive and negative, associated with various techniques. This enabled groups to identify the method suited for their individual needs. The next critical component is to sell a product effectively. CIFT partnered with The Ohio State University to deliver a Market Ready training program that served as a comprehensive

tool for any grower to be informed of handling, delivery, invoicing, record keeping, and all critical components associated with market entrance.

Produce and document the knowledge required to facilitate successful supplier/buyer relationships within the community.
To compliment this portion of the program, CIFT interviewed numerous retailers, farm markets, restaurants, wholesalers, and distributors to specifically direct growers on what is desirable. Three new commercial relationships were established between Fernwood Growing Center and the Toledo Farmers Market, the Community Market, and Pam's Corner; a local restaurant. Agreements are being pursued for 2013 harvest season. An example is a restaurant, Pam's Corner, who obtained product grown within the urban setting from the hydroponic approach and used it to compare to other market options. The response was positive and resulted in direct purchase agreements with growers. She averages $3 to $4 per pound for mixed greens to $2 a bundle for herbs. A broker was also engaged in this process and supplied two additional restaurants. He found the cleanliness of the product from the vertical system to be particularly favorable and was paying $1 pound of leafy greens and $4 for basil. Additional examples of market opportunities was reflected in CIFT coordinating a booth at the Toledo Farmers Market wherein five community groups were provided an outlet to sell direct to consumers. Educational efforts were applied to inform them of details such as packaging to pricing which will be useful in future efforts when selling at similar venues.

The desired program revenue was not achieved due to the limited amount of product for inclusion. It is anticipated that each year, more sales will result from these outlets and the retail establishments in which connections were fostered. The participants at the Toledo Farmers Market averaged $100 in sales each week from product grown at their location. A couple additional organizations supplemented the efforts due to the limited product from the partners associated with this project. Each organization averaged $100 per week in sales. Product from Fernwood was sold at a local Community Market and was deemed favorable by customers who otherwise had limited to no access to fresh produce. Crops, particularly peppers, were also utilized at the Northwest Ohio Cooperative Kitchen enabling the growers to supply food processors with ingredients from a local source. All of these channels for product resulted in information valuable for other operators.

At the year-end meeting coordinated by CIFT, the organizations complete a form depicting crops grown, quantities, connections made with buyers, and revenue resulting from efforts. This information will be collected each year to monitor performance and advancements. Communication continues throughout the growing season in an effort to address any challenges but more so share insights on new customers (retail and wholesale) desiring fresh product. Electronic communications are utilized to share insights and inclusion within Ohio MarketMaker can assist with identification of new leads.

A local organization selling produce at the Toledo Farmers Market.

Beneficiaries

At the start of this initiative there were 100 community gardens, 15 high density vertical systems, a hoop house, and plans for a farm incubator. At the conclusion of this project, there are 125 community gardens, 35 hydroponic vertical systems, 3 hoop houses with 2 additional being planned, a growing center being developed, 55 grow Soxx units, and more groups considering inclusion around Toledo. The training facilitated by this project will enable growers to understand the challenges associated with sales and recommendations on techniques best suited for available resources. Toledo is the 8th poorest city in the nation with significant poverty and unemployment numbers. This frequently equates to limited access to fresh produce. Many of the groups to embrace production did so strictly for the enhancement of local access and therefore, did not fully apply the resources. However, even these locations increased knowledge and awareness of the consuming population of fresh, local produce that will lead to increased purchasing decisions.

All of the data collected will serve as a roadmap for continued evaluation and implementation of a strong local food system. A notable economic impact resulting from this effort at the Fernwood Growing Center was the employment of an Urban Farm Manager. A young man within the neighborhood was hired to monitor the garden, provide daily operational support, harvest, and learn to sell at the farmers market. This job will continue into the next growing season and will be expanded to include raised bed and high tunnel production.

The primary beneficiaries of this effort were the collaborating entities with whom the work was applied for increased production and market outreach. However, the

information gained from the networking, interactions, and connectivity with each aspect of the food system has been shared with the more than thirty organizations in Toledo aiming to achieve sustainable gardens. Equally, numerous growers in Cleveland are being informed of the details associated with this effort and additional meetings are being conducted in Columbus for a city-wide initiative in the urban epicenter. CIFT coordinated a display reflecting the findings and resources at the Ohio Produce Growers and Marketers Association Trade Show and is under consideration as a topic for next year's educational programming. Information will be featured through newsletters to urban growers, social media, websites, and programming in the upcoming months. Any produce grower can benefit from the resources associated with this project.

Lessons Learned

An immediate challenge associated with some of these practices related to the urban zoning issues and permit requirements, particularly when installing a hoop house. This was a delay and typically added cost to achieve. Information has been shared with the city in hopes of expediting this in the future; however, each location is evaluated separately and may have unique challenges that result. A secondary lesson reflected the differential in goals. It was not always a priority for outlets to "sell" product rather give away to the neighborhood. Although this is a positive, it did create issues with encouragement of local purchasing by retailers and wholesalers.

For those more interested in business development aspects, information was provided. Businesses such as Churchill's Grocery, Monnettes Market, MacQueen's Market, Anderson's, Sautters, and Kroger provided valuable insights with regard to the procurement decisions and their relationship with growers.

Finally, a survey was conducted at the farmers market to determine consumer preferences associated with urban grown produce. When asked what is most appealing about this product, the popular answer was "all of the above," which included, grown in your own neighborhood, managed by a familiar organization, locally produced and fresh.

Once a product is sold at a farmer's market, customers must chose amongst price, quality, location it was grown and the type of product. According to the survey, consumers are most conscientious about the quality of the product sold, with the price a strong factor. Other important details resulting from the survey include approximately 70 percent of the respondents would be willing to pay more for products from Toledo and 94 percent would purchase the product over another if it were in the grocery store.

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Additional Information

Due to the variances associated with growers and desirable goals, direct interaction and training was frequently applied. Depending on location, crops, and production capacity

information was tailored and specific to various market opportunities. This was not an effort that a "guide" was suited for when it came to market connectivity. However, the portfolio of various approaches to growing was well received and enabled for expansion activities. As additional information is collected it will be incorporated into the message for growers to ensure a comprehensive approach to local food system development.

Appendix
1. Press release for one of the training sessions
2. Portfolio reflecting growing practices

Project Title: Create more cost-effective, collaborative food distribution systems

Project Summary

The Southern Producer's Marketing Cooperative (SPMC) project was designed to help Ohio Specialty Crop producers diversify and increase their farming operations through facilitation and development of an extensive specialty crop distribution network. By partnering with cooperating Ohio food processing/brokering/distribution providers, this project was able to facilitate the development, organization and incorporation of a specialty crop growers Cooperative, the Our Harvest Cooperative Incorporated (OHCI). Additional member benefits of the Cooperatives formation include group purchasing, GAP food safety grower training, third party certification training, networking and equipment sharing.

The project did gain knowledge and experience that can be shared with others who choose to replicate this business structure. Project experiences indicate that farmers are reluctant to change their ways and to buy into a new cooperative produce marketing opportunity such as OHCI. It takes time building relationships and a trust among all members and potential members of the Cooperative before commitments are made as well as educating the growers of the benefits to them of joining a Cooperative. Cooperative formations take time, trust and financing.

Listed below are the Identified needs/gaps in the support of specialty crops growers cooperative businesses as part of the 2009 SCBGP:

- Development of traditional or employee-owned cooperative type business models
- Profitable business models/plans development
- Identification of financing options
- Conduct job/occupational analysis for training development and trainee achievement tracking
- Develop training strategies, educational, and business support programs.

As a result of the 2009 SCBGP project the Our Harvest Cooperative (OHCI) quickly identified that additional specialty crop grower training is required. From this experience a Specialty Crops Growers Education and Training certificate and

apprenticeship program is being developed and is planned to be offered beginning in the spring of 2013. The other identified needs/gaps have and are being addressed by Our Harvest Cooperative as well.

Project Approach

For the initial development phase of the Southern Producer's Marketing Cooperative project, formally incorporated as Our Harvest Cooperative Incorporated (OHCI) in 2012, new viable produce markets were initially established to develop a core specialty crop market structure for the Cooperative. This began with the development and submission of a proposal to the Ohio Department of Administrative Services in 2010 along with quality project distribution partners to supply fresh fruits and vegetables to Ohio prisons and other state owned institutions. From this proposal a three year, $6 million produce contract was awarded beginning April 2011 of which initial specialty crops were planted and grown.

Cooperative organizational meetings were organized and conducted since 2009, with the assistance of Brad Bergefurd and Tom Snyder to plan, discuss and finalize the articles of incorporation, board of Directors, by laws, official name of the Cooperative, grower/member training as well as special projects to be completed by the Cooperative. Frequent meetings were set up and facilitated by Bergefurd and Snyder with interested individuals from the onset of the project which led to the eventual development and formation of the Our Harvest Cooperative three members Board of Directors and the election of officers of its various committees. The core business employee perks services was offered to the Our Harvest Cooperative however the Board of Directors elected not to participate. No funds were spent from the grant on this service**.** Since the Our Harvest Cooperative Board of Directors elected not to participate in this program they did not participate in the Vendor/Members Conference.

Three feasibility and start up meetings were organized and conducted within a 50 mile radius of the Greater Cincinnati area throughout the summer of 2012 with other possible new cooperative formations, potential cooperative growers and OHCI members. Our Harvest Cooperative entered into contract with several providers to develop and incorporate the Cooperative. These providers included; Eric Britton, Attorney, USA Payroll Network/ Chip Fugate for payroll and tax preparation, Workers Compensation Insurance and product liability insurance companies. The Cooperative also pursued and is acquiring NAP (noninsured crop disaster assistance) insurance available through the USDA as well as crop hail insurance policies as available. Cooperative grower/members participated in mandatory USDA Good Agricultural Practices Training (GAPS) programs. OHCI also has made application to begin the organic certification process. This process will take up to three years to complete the certification process. OHCI is utilizing the services of the Ohio Ecological Food and Farm Association an Ohio based organic certification agency to complete this process.

All information regarding the analysis, development, training and start up of the Our Harvest Cooperative was posted on the Ohio Cooperative Development Centers web site http://ocdc.osu.edu/.

Lesson Learned

There are great opportunities in Ohio to provide locally grown produce to Ohio institutions and produce buyers and the future plan of OHCI is to build upon and replicate this Cooperative model throughout Ohio. From the results of this project it was identified that additional specialty crop grower training is required throughout Ohio, therefore a Specialty Crops Growers Education and Training certificate and apprenticeship program is being developed and is planned to be offered beginning in the spring of 2013. OHCI is pursuing other regional/local cooperatives efforts including a kitchen incubator, cooperative food store and local restaurant. OHCI has future goals to increase the number of farmer/members by adding satellite cooperative farms and other businesses and to become a food hub resource center for other food hub initiatives around the country. OHCI is currently conducting a Food Hub feasibility study which is focusing on the development of a "regional food hub", a centrally located facility in the Cincinnati area with a business management structure facilitating the aggregation, storage, processing, distribution, and/or marketing of locally/regionally produced food products.

Project staff including Bergefurd and Snyder spent countless hours meeting, talking, educating and answering questions regarding Cooperative structure and organization and in discussing the opportunity that existed for a Southern Growers Cooperative to grow fresh locally grown produce for local Ohio markets. Eventually, after many meetings, brainstorming sessions and discussions a key group of individuals who were also able to see the potential vision formed the Board of Directors and officially formed the Our Harvest Cooperative Inc.. It took many meetings just to come to an agreement by all involved of an official name and logo for the Cooperative which from past experiences is not uncommon with the formation of Cooperatives.

Goals & Outcomes Achieved

Processing/brokering/distributor partnerships

A goal of the project was to execute partnerships with Ohio specialty crop processing, brokering and distribution providers. Through this cooperative network formation partnerships were developed with existing Ohio specialty crop processing/brokering/distribution providers including; North South Produce of Chillicothe, Ohio; DNO Produce of Columbus, Ohio and Central Marketing Associates of Delaware, Ohio whom previously sourced many specialty crops from outside of Ohio to fill market demands.

Direct Produce Market Development and Sales

Markets for locally grown produce continue to develop at a faster pace than the early start up Our Harvest Cooperative alone can grow currently; therefore other grower/partners were able to increase production to supply in season produce for markets that have developed from the onset of this project. Brad Bergefurd and project partners provided

assistance and expertise which led to the negotiation and acquiring of an innovative produce supply contract with the Ohio Department of Administrative Services/ Ohio Department of Rehabilitation and Corrections to procure Ohio-grown produce for all Ohio prisons and institutional purchasers. Results from an IMPLAN analysis conducted by the Community Economics program of OSU Extension, Community Development concluded the total economic impact for this one year of produce sales from this project resulted in a total economic impact of $10,777,758, over double the one year total direct produce sales of $5.1 million, almost 75 jobs were created or supported and almost $5.7 million additional income was generated to support other businesses and industries throughout Ohio. There are 2 other potential sites looking to replicate the OHC project in their areas. The Mahoning County-based agricultural non-profit, Goodness Grows, is leading the development of a Northeast Ohio network of diversified specialty crop farms based on the principles of the Our Harvest Cooperative Incorporated project model. Another group based in West Virginia but that are located close to the Ohio border and that has growers located in Ohio also heard of the Our Harvest Cooperative project and are exploring options to replicate this model and establish a similar project as well. The Our Harvest Cooperative as of the completion of this project did not enter into direct contract with other members. The articles of Incorporation and bylaws for the Our Harvest Cooperative Incorporated were written up and the paperwork was completed and submitted and approved by the State Auditors office. Our Harvest Cooperative, Inc. (OHCI) was officially formed March 8, 2012 and is located at 9696 North Bend Road, Cincinnati, Ohio 45224.

Another goal of the project was achieved in that jobs were created or retained and more wealth and income was generated back into Ohio's economy. From April 2011 through April 2012, sales of produce to the prison system market totaled $5,111,515. To determine the economic impact that this first year of local produce sales had on Ohio communities an IMPLAN (IM pact **analysis** for PLANning) impact analysis using classic input-output analysis in combination with regional specific social accounting matrices and multiplier models, was generated. From the analysis, the direct produce sales for the one year supported a total of 74.3 jobs, and resulted in total impact of $10,777,758, at $5,677,758, over double the direct sales of $5.1 million. Total impact is the sum of the direct ($5.1), indirect (other businesses spending as a result of the direct), and induced (spending by workers who receive income) effects. In essence sales of produce to the prison system during this first year had a multiplier effect of 2.1 ($10.8 million/5.1 million). In summary because of one year of produce sales, almost 75 jobs were created or supported and almost $5.7 million was generated to support other businesses and industries throughout Ohio. Sales figures from April 2012 to present have not yet been tabulated and reported but preliminary reports indicate an increase in produce sales for this time period. Not only did this contract provide new production and marketing opportunities for Ohio growers and contract growers, in total, the new contract saved the state approximately $443,600 during the 12-month period, as against total billings of $5,111,515 during the period. The savings resulted primarily from minimized shipping costs in Ohio by buying from local growers and the ample capacity of Ohio farmers to diversify and increase their production for this newly established market structure.

Legal Cooperative Formation

Another goal achieved by this project was the agreement upon and selection of a name for the growers Cooperative that being the Our Harvest Cooperative, Inc. (OHCI). Another goal was achieved in that the articles of Incorporation and bylaws (see attached) were written up and the paperwork was completed and submitted and approved by the State Auditors office (see attached). Our Harvest Cooperative, Inc. (OHCI) was officially formed March 8, 2012 (see attached certificate of incorporation) and is located at 9696 North Bend Road, Cincinnati, Ohio 45224. OHCI is a newly developed business model with a mission to supply Ohio markets with locally grown farm produce, to provide markets and consumers access to locally grown food, create good, green jobs, , and increase the viability of local food systems with sustainable farming practices. The OHCI beliefs consist of systems to train and support farmers, incubator/contracted, and hub owned farms, and a food hub center for aggregation, processing, marketing, sales, and distribution of local products. By locating operations in the Greater Cincinnati area, OHCI is providing training/employment opportunities for members of the community and work with stakeholders to develop programs to address the issues of food security.

Supplies/Services/Products offered

Good Agricultural Practices (GAPS) training programs, another objective of the project, were provided and held at the OSU South Centers in Piketon, Ohio in the spring 2011, the spring of 2012 and in Cincinnati in December 2012 so that OHCI growers and others throughout the region could be trained and receive a certificate of completion of the Ohio Good Agricultural Practices Training taught by the OSU Food Safety Team. Lorain County Community College also provided/is providing contractual services for local, specific, OHCI grower related legal consulting, accounting consulting, grower and Good Agricultural Practices/Third Party Certification training and Best Practices training for the grower members of OHCI.

Project replication throughout Ohio

Three feasibility and start up meetings were organized and conducted within a 50 mile radius of the Greater Cincinnati area throughout the summer of 2012 with other possible new cooperative formations, potential cooperative growers and OHCI members. This study also sought to determine future contract options with local growers. There are 2 other potential sites looking to replicate the OHC project in their areas. The Mahoning County-based agricultural non-profit, Goodness Grows, is leading the development of a Northeast Ohio network of diverse specialty crop farms based on the principles of the Our Harvest Cooperative Incorporated project model. Another group based in West Virginia but that are located close to the Ohio border and that has growers located in Ohio also heard of the Our Harvest Cooperative project and are exploring options to replicate this model and establish a similar project as well. Our Harvest Cooperative as of the completion of this project did not enter into direct contract with other members. Three feasibility and start up meetings were organized and conducted within a 50 mile radius of the Greater Cincinnati area throughout the summer of 2012 with other possible new cooperative formations, potential cooperative growers and OHCI members. The Mahoning County-based agricultural non-profit, **Goodness Grows**, is proposing to lead

in the development of a Northeast Ohio network of diversified specialty crop farms based on the principles of the Our Harvest Cooperative Incorporated project model.

Beneficiaries

Beneficiaries of this project are many. They include new farmers, existing farmers, Ohio produce buyers/distributors/processors, Ohio produce markets including Ohio's prisons and institutions and Ohio communities. The model developed through this project can be easily replicated throughout Ohio as well as neighboring states such as Kentucky and Indiana. Potentially this model can increase specialty crop production for new and existing growers and decrease the operational costs for specialty crop growers looking to expand production. This could impact many Ohio growers' cost-effectiveness which would be made possible by the power of model cooperative business structures like OHCI.

Produce sales figures from April 2012 to present will be tabulated and reported after April 2013 but preliminary reports indicate an increase in produce sales for this time period. Not only did this contract provide new specialty crop production and marketing opportunities for the Our Harvest Cooperative and other Ohio growers, in total, the new contract saved the state approximately $443,600 during the first 12-month period, as against total billings of $5,111,515 during the period. The savings resulted primarily from minimized shipping costs in Ohio by buying from Our Harvest Cooperative, local growers and the ample capacity of Ohio farmers to diversify and increase their production for this newly established market structure. Other beneficiaries from this project include the farmers, members and markets that could develop from the two new groups looking to replicate this project and model. Also projections indicate that up to 125 new worker owners will be needed for the newly formed Our Harvest Cooperative within five years and once the business plan projections are fully implemented upwards to 400 worker owners will be needed to fulfill market projections within 10 years. Other beneficiaries include the markets, consumers and growers that will benefit from the projected $5 million shift in purchases of fruits and vegetables that have traditionally been sourced from out of state growers and suppliers that are planned to be sourced locally.

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Additional Information

It has been our experience that cooperative are successful because they choose to start the business by implementing divisions of the total proposed business effort that have the best chance of success, meet the critical and common needs of the members, and addresses the main purposes of the cooperative. It is with that in mind that we provide the

following comments. We believe that the Our Harvest Cooperative Incorporated (OHCI) has developed a new opportunity in Ohio, which has only been made available in the last two years, for Ohio farmers to continue to grow for the wholesale produce market. With the formation of OHCI there now is opportunity to increase Ohio food aggregation and distribution and to move food to buyers (such as the corrections institutions, Kroger, restaurants, other stores, schools, etc.) in Ohio of products produced in Ohio. From our partnerships and the working relations formed with the food processing/brokering/distribution providers on this project, the following are some possibilities they offered for a continued partnership with OHCI and other Cooperatives:

a) Contracts for product production would be established before the production season
b) Containers would be provided for each pick-up site
c) Pick-up of farm products from the farm (approximately 50 acres or larger) and/or other aggregation locations would be provided
d) Costs of farm production inputs (seed, plants, fertilizers, etc.) could be funded
e) Other funding opportunities may be on the table

OHCI will continue to recruit existing mid-size farmers to become worker-owner farms and also lease and/or share-crop farm land to start-up their own new worker-owner farm(s). These worker-owner farms' produced products could be sold to aggregation and distribution buyers, supply a Cincinnati Food Hub store, and/or be provided to other OHCI buyers. This effort could result in the early creation of well over 35 new jobs annually with a salary equivalent to $9/hr. full time, with healthcare/retirement benefits, which we believe is an important future goal of OHCI. As OHCI grows its wholesale marketing division, later it could expand aggregation and distribution functions of the business operation and the purchasing of some of the worker-owner farms. This expanded wholesale division could soon support a food processing facility with already having the quantity of product needed to make that operation feasible. Once established, there could be many more opportunities for small and large growers to market their products with OHCI and other affiliated businesses.

Project Title: Increase the capacity of a new Chestnut Grower Cooperative

Project Summary

This grant supported the start-up of an agricultural cooperative and supporting facility dedicated to packing, storing, and marketing of chestnuts produced by member growers. Most of the start-up costs were financed by the grower members themselves, but the grant provided critical help in building chestnut-specific equipment, internet-based marketing, and community/industry outreach. After three seasons of grant assistance, the cooperative is now financially self-sufficient.

Our chestnuts are hand-harvested. Harvest season is 3-4 weeks long from mid-September to mid-October when weather is generally pleasant. More than 100 pickers are recruited to do the job. Being in an Amish community and also rural Appalachia, many pickers look forward to the annual chestnut harvest when "millions of pennies fall to the ground

for anyone who is willing to pick them up". The pickers benefit from the co-op as much as the co-op depends on them.

Customers have benefited from the co-op. We have gotten lots of feedback indicating how pleased people are to have found us and that they enjoy our quality product. Potential growers have attended our open houses or visited our website. They realize and have said that the existence of a cooperative offers good incentive for them to plant chestnut trees. Even with a modest acreage they can produce chestnuts and have an easy outlet without having to worry about postharvest handling, storage, or marketing. Thus, we have been selling chestnut trees to nearby landowners. Because we now have excess handling capacity and buyers, we have already bought substantial quantities of chestnuts from other growers.

We have been open to sharing ideas, knowledge, and supplies like chestnut bags with other chestnut growers across the country, esp through organizations like the Chestnut Growers of America. Since the chestnut industry is small, demand for the product is high, and production knowledge is lacking, cooperation among growers benefits us all. Thus, the benefits from this grant to our business will have substantial spill-over to others in the industry.

Project Approach

Having been in the chestnut business for over 25 years and having received several research grants in the past, we had a well-thought-out plan for what the facility ought to be and do. Based on the overlap of our business needs and allowable grant costs we decided to use grant money: 1) to fund a dedicated hot water dipping tank, necessary for treating chestnuts against chestnut weevils, 2) to fund development of internet-based marketing, and 3) to fund industry and community outreach programs showcasing our endeavors for the benefit of others. Metrics for evaluating success included efficacy of processing equipment and procedures, efficacy and volume of internet sales, feedback from outreach programs, and most importantly, throughput costs of our new facility.

For years four Ohio chestnut growers had been producing and marketing their production together. When their steadily increasing production exceeded their on-farm capacity to handle their crop, they decided to form an agricultural cooperative and build a new, larger facility to accommodate their burgeoning crop. The purpose and function of the facility was (is) to collect, clean, size, grade, pack, store (refrigerate), and ship chestnuts to wholesale and retail customers all across the USA. The cost to construct and equip such a facility was about $250,000. Additional funds were necessary to operate the facility. Most of the start-up money was contributed or loaned to the co-op by grower members, mainly borrowing from their personal home-equity loans. The SCBG Grant was sought to help in this endeavor. The specific portions of the business start-up to be funded by the SCBG were mainly dictated by allowable costs of the grant program. Thus, the SCBG did not fund a stand-alone project but was a critical part of a much larger project. In the long run, the financial driving force for this business was (and is) chestnut trees already in the ground and a market demand for chestnuts that exceeds our supply.

This last metric is dependent on the whole facility, not just the portion funded by the SCBG. **Hot water dipping tank (aka "nut jacuzzi").** All chestnuts that are potentially infested with chestnut weevil larvae must be hot water treated before delivery to customers. To accomplish this we designed and built a batch treatment tank that treats 1,000 lb of chestnuts in 30 min. The first iteration required minor redesign which slightly increased its cost, but is now fully functional. The treatment has been 100% effective in killing chestnut weevil larvae or eggs at a cost of <$0.02 per lb. This treatment is a viable alternative to methyl bromide which is currently mandated for treatment of imported chestnuts. A spin-off of the technology is that the process was found to be effective for treating chestnut nursery stock that is infested with Asian chestnut gall wasps (an introduced pest). We currently use the tank to treat nursery stock in addition to fresh chestnuts. The treatment does not harm viability of seed chestnuts or nursery stock.

We put an attractive sign on our new building and hosted two annual open houses
We had 25-lb chestnut bags custom made ("Chestnuts Produced and Packed in the USA") for our own use and offered them to other chestnut growers across the country. Demand was such that we had to re-order (10,000 bags each order). We printed three different brochures: one introducing our business, one describing commercial chestnut growing, and one to be enclosed with fresh chestnut orders ("how to store and use chestnuts").

In order to direct-market our products nationwide, we upgraded our website (www.route9cooperative.com) and connected it to an online shopping cart. This combines an informative internet-based catalog with credit card processing and order fulfillment. Considerable time and effort was required to make it work but the result is that we greatly increased our online sales. In 2010, our web-based sales totaled $13,500; in 2012, e-commerce was up to $54,400. We expect the volume to continue to increase in future years. Our website and e-commerce platform provide convenience for customers and streamline our sales and order fulfillment. By shifting sales from wholesale (still our mainstay) to retail we are able to sell our products at higher prices.

Hiring of the "marketing manager" described in the proposal was actually accomplished by hiring 2 people: Dan Kirk, who managed the nut handling and order packing, and Loretta Brown, who managed order taking, accounting, and website integration. Both of them served the co-op for the past 3 seasons.

Chestnut harvest and marketing season is when chestnuts are purchased from growers and sold to buyers. The fourth quarter of the project is the offseason. Preparations will be made for the open house, as well as facility & equipment upgrades preparing for the open house. Our first open house was part of the Ohio Sustainable Farm Tour and Workshop Series. Over 100 visitors toured our facility.

The 2011 Chestnut harvest and marketing season has increase over 2010 because the labor cost was $0.43 per lb; in 2011, it was $0.29 per lb; and in 2012, it was $0.25 per lb. Clearly, the trend is in the right direction.

The first educational workshop completed in August 2011 consisted of our first open house which was part of the Ohio Sustainable Farm Tour and included a Workshop Series. Over 100 visitors attended. We conducted facility tours, orchard tours, and offered chestnut trees to attendees.

Goals & Outcomes Achieved

Hot water dipping tank (aka "nut jacuzzi"). All chestnuts that are potentially infested with chestnut weevil larvae must be hot water treated before delivery to customers. To accomplish this we designed and built a batch treatment tank that treats 1,000 lb of chestnuts in 30 min. The first iteration required minor redesign which slightly increased its cost, but is now fully functional. The treatment has been 100% effective in killing chestnut weevil larvae or eggs at a cost of <$0.02 per lb. This treatment is a viable alternative to methyl bromide which is currently mandated for treatment of imported chestnuts. A spin-off of the technology is that the process was found to be effective for treating chestnut nursery stock that is infested with Asian chestnut gall wasps (an introduced pest). We currently use the tank to treat nursery stock in addition to fresh chestnuts. The treatment does not harm viability of seed chestnuts or nursery stock.

Website integrated with e-commerce capability. In order to direct-market our products nationwide, we upgraded our website (www.route9cooperative.com) and connected it to an online shopping cart. This combines an informative internet-based catalog with credit card processing and order fulfillment. Considerable time and effort was required to make it work but the result is that we greatly increased our online sales. In 2010, our web-based sales totaled $13,500; in 2012, e-commerce was up to $54,400. We expect the volume to continue to increase in future years. Our website and e-commerce platform provide convenience for customers and streamline our sales and order fulfillment. By shifting sales from wholesale (still our mainstay) to retail, we are able to sell our products at higher prices.

Industry and community outreach. We had 25-lb chestnut bags custom made ("Chestnuts Produced and Packed in the USA") for our own use and offered them to other chestnut growers across the country. Demand was such that we had to re-order (10,000 bags each order). We put an attractive sign on our new building and hosted two annual open houses. Our first open house was part of the Ohio Sustainable Farm Tour and Workshop Series. Over 100 visitors toured our facility. We printed three different brochures: one introducing our business, one describing commercial chestnut growing, and one to be enclosed with fresh chestnut orders ("how to store and use chestnuts"). We continue to maintain our leadership role in the chestnut industry.

Throughput efficiency. A major justification for the construction of our new facility (partly supported by this grant) was that the facility would allow for more efficient handling of our chestnut crop. In 2009 (before this facility was built), the labor cost for packing and marketing was $0.53 per lb. In 2010 (1st year of co-op), the labor cost was $0.43 per lb; in 2011, it was $0.29 per lb; and in 2012, it was $0.25 per lb. Clearly, the trend is in the right direction. This trend occurred in spite of the fact that we increased wage rates over this period. We expect the efficiency to continue to improve in the future

as we solve more problems.

The following table summarizes crop sizes and labor costs for the three years of the cooperative.

Year	2010	2011	2012
Total crop (lb)	30826	52578	72674
Brown (office)	$4,330.00	$3,990.00	$5,310.00
per lb	$0.140	$0.076	$0.073
Kirk (nut handling)	$6,905.00	$7,540.00	$6,810.00
per lb	$0.224	$0.143	$0.094
grading/packing labor	$2,110.00	$3,806.00	$6,040.00
per lb	$0.068	$0.072	$0.083
total per lb	$0.433	$0.292	$0.250
invoice receipts	$82,884.00	$86,741.00	$137,156.00
online receipts	$13,494.00	$28,771.00	$54,364.00
total sales	$96,378.00	$115,512.00	$191,520.00
per lb	$3.13	$2.20	$2.64
online/total	0.14	0.25	0.28

Beneficiaries

Of course, the main beneficiaries are the grower-members of our cooperative. The cooperative facility and skilled operators allow for expedient handling and marketing of a safe, high quality product – much more cost effectively than any of the growers could manage on their own. Thus, the cooperative provides the growers more time and money to devote to their crop production. The grant effectively allowed the co-op to more aggressively pursue web-based marketing and it reduced the size of the co-op's start-up loan.

Our chestnuts are hand-harvested. Harvest season is 3-4 weeks long from mid-September to mid-October when weather is generally pleasant. More than 100 pickers are recruited to do the job. Being in an Amish community and also rural Appalachia, many pickers look forward to the annual chestnut harvest when “millions of pennies fall to the ground for anyone who is willing to pick them up”. The pickers benefit from the co-op as much as the co-op depends on them.

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The cooperative currently has 5 member-growers, 1 less than when the proposal was written (it was written before the co-op was formally established). The grower who did not become a member did not have enough production to meet our minimum requirement of providing 1,000 lb of chestnuts per year to the co-op. Presently, there are no other chestnut growers in Ohio who have >1,000 lb of annual production (i.e., are eligible for membership). However, through our workshops and Empire Chestnut Company nursery sales, several growers have expressed an interest in becoming members when their trees start producing enough. In fact, the existence of the co-op has provided incentive and the missing component that allows potential growers to become actual growers; this is what they have told us. We have been working with the largest grower in PA, Jim Kohr, from whom we purchased 11,000 lb in 2012. We are currently working on the logistics that will allow him to become a full member. Without the co-op facility we would not be able to handle Jim's crop.

Lessons Learned

Even though this grant supported the start-up of a new business, the members of the cooperative had been growing and marketing chestnuts together for many years prior to this grant. We had an idea of what we were getting into and where we wanted to go. It's not that we didn't make mistakes – it's just that we had become adept at fixing things. Since the time period for completion of the grant was several months longer than originally planned, we had enough time for an additional season. The additional season allowed us to re-engineer the hot water treatment tank and to bring our internet-based shopping cart up to speed. The logistics of internet selling are considerably more complex than we had anticipated. Setup and maintenance of the website is time consuming. And so is customer service. It's not just putting things in boxes and sending them out; we need someone to answer e-mails and phone calls. Nevertheless, after the 2012 season, we are confident that the cooperative can move forward on its own financial power. During the chaotic and financially stressful first three seasons, it was a great comfort to be able to periodically realize that.

Contact

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Project Title: **Reduce Food Deserts by increasing access to specialty crops for all Ohio consumers**

Project Summary

There are rural and urban communities in Ohio with limited access to (physical, economic and healthy), and knowledge of, specialty crops. Many large supermarket chains have closed urban stores due to consolidation of the retail industry and the movement of wealth to suburban communities. Corner stores are often the only option for urban consumers to purchase food- or food-like products. The selections of specialty crop products is often limited or non-existent. This has implications for the health of Ohioans and the viability of Ohio specialty crop producers. Likewise, rural consumers may have access to a large supermarket if they drive long enough (and have access to a vehicle) but often there is a lack of competition makes food more expensive. These situations are present in what is being termed "food deserts." The language in the 2008 Farm Bill defined a food desert as an "area in the United States with limited access to affordable and nutritious food, particularly such an area composed of predominantly lower income neighborhoods and communities" (Title VI, Sec. 7527). In practical terms the method for identifying food deserts uses three broad aspects of accessibility - physical accessibility, economic accessibility, and healthy accessibility.

Ohio is committed to not only understanding the extent of food deserts in Ohio, but also to increasing access to healthy foods (including specialty crops) in these areas. In August 2007, Governor Strickland established the Ohio Food Policy Advisory Council (OFPAC) by Executive Order #27S. This executive order expressed the environmental, social, and economic benefits that Ohio's food and farming system currently contributes to the state and the need to expand those benefits by focusing on retention and expansion of the industry. In addition, the order also addressed the critical importance of providing assistance to Ohioans who have limited or no access to healthy and fresh foods. Consequently, a goal approved by the whole council is to "identify rural and urban food deserts in Ohio by Dec. 31, 2009, and decrease these areas by 10 percent by providing access to healthy, local foods by 2015."
Further, Governor Strickland announced the initiative "Ohio Neighborhood Harvest" in his 2010 State of the State address. The Ohio Neighborhood Harvest is an initiative of Governor Strickland to improve access to Ohio grown products and ensure that people in every neighborhood in the state have access to affordable, healthy food.

This attention to food deserts represents an opportunity to address healthy food access. To this end, the OFPAC, along with the Ohio Department of Agriculture, the Center for Farmland Policy Innovation (Center) and the Ohio Department of Health, worked to identify areas classified as food deserts and compile best practice solutions from across the United States. Moreover, fourteen local food policy groups across the state have increasing access to healthy food as at least part of their mission.

The purpose of this project was to build upon this work by identifying three communities that have both the need and the capacity to begin implementing creative food desert solutions resulting in more specialty crop options for consumers

and new markets for Ohio specialty crop producers. The identified solution was to work with community partners to create healthy retailing options in food deserts in these three communities and match demand to the new supply of fresh produce through educational programming. To assuage risk, the provide community partners with technical assistance (ex. food safety, marketing, outreach.), project materials and needed supplies (ex. refrigeration devices, shelving, educational materials) to introduce fresh produce in their stores and drive demand for these products.

Project Approach

The Ohio Department of Agriculture required a 50% match for this proposal which we accomplished. Therefore, no funds were used to secure additional dollars. So it was the proposal that secured the additional dollars, not the work itself.

The project targeted three communities throughout the state of Ohio that have documented food deserts. The overall approach was to have a community partner work with existing retail outlets in each community that did not previously carry fruits and vegetables to introduce specialty crops in to the store. This effort to increase specialty crop supply was matched with generating demand in the community. At the same time, the community partner would work on nutrition education and specialty crop promotion to drive demand to the stores.
Jill Clark, PI and the director of the Center for Farmland Policy Innovation (Center), lead the project.

- We at the Center developed a best practices memo on healthy retailing interventions and promoted it nationally through the healthy corners store network and the community food security listserv and to all of the partners through the center (http://aede.osu.edu/sites/drupal-aede.web/files/imce/2011_3.pdf).
- A state-level advisory board was created to help frame the work. This group included representatives from the Ohio Department of Agriculture, the Ohio Produce Growers and Marketers Association, and nutrition educators.
- The advisory group for the Ohio Neighborhood Harvest project assisted in site selection, assessed the evaluation plans, and established the guiding principles. Research conducted by the PI on food deserts was utilized in site selection (http://aede.osu.edu/sites/drupal-aede.web/files/imce/2010_5.pdf).
- A community partner was selected for each site: Franklinton Gardens in Columbus, Summit County Food Policy Coalition in Akron, and Rural Action in Morgan and Meigs Counties.
- A national healthy corner stores expert Kara Martin to Columbus in order to provide training, resources, and technical assistance necessary to begin project planning to the advisory board and to all community partners.
- All community partners followed the same general approach. On the supply-side, each partner recruited retailers to participate, matched store owners with distributors that carried Ohio specialty crops and assisted the store own with sales, management of product and displays. On the demand-side, each conducted an assessment of what specialty crops local residents wanted in the stores, promoted new offerings of produce and conducted nutrition education.
- At our Franklinton, Ohio sites

        - Owners of three retail sites agreed to begin carrying specialty crops and now carry stock.
        - Interior work to highlight specialty crops in stores: new lighting, displays, cleaned and repaired refrigeration units used for fruits and vegetables, painted.
        - Educational programming regarding specialty crops
            - Cooking Matters - participants learn how to select nutritious and low-cost ingredients, and prepare them in ways that provide the best nourishment possible to their families
            - Expanded Food and Nutrition Education Program (EFNEP) - participants learn how to eat healthier and be more active even on a limited income by making food choices to improve the nutritional quality of the meals served to their families
            - Veggie Van - participants receive deliveries of low-cost, pre-packed bags of fruits and vegetables at partner sites in selected neighborhoods where cooking demonstrations also occur using the contents of that week's bag
    - At our Akron, Ohio sites
        - Owners of two retail sites agreed to begin carrying specialty crops and now carry stock. Some store improvements to high light the specialty crops were undertaken.
        - A distributor was found that would work with Ohio farmers to carry Ohio specialty crops to serve the two retail sites.
        - A new local partner was brought on board, the local Community Action Agency. This agency was able to do specialty crop campaigning through a grassroots network using a door-to-door strategy in the neighborhood around the healthy corner store sites.
        - Educational programming at healthy corner stores included cooking with specialty crops and other healthy items found in the store, flu shots, and diabetes screening.
        - Educational programming also took place across the street at the community garden regarding how to care for and prepare specialty crops.
        - One of the store owners started a new program in his store. If customers want store credit, they first have to purchase specialty crops.
    - At our Chancey, Ohio site
        - The owner of a retail site (a beer drive through) agreed to start carrying Ohio specialty crops in his store. Shelves were built for the produce and space made in a cooler.
        - The nearby Chesterhill Auction was used to source the store.
        - The effort to carry Ohio specialty crops was highlighted in the press and received attention.
        - Educational programming through Expanded Food and Nutrition Education Program (EFNEP) took place across from the store at the local library.
        - New relationships were built with the Athens Department of Health, which is working to expand the program.
    - Over the course of the projects, Kara Martin of Urban Food Link and a national expert in healthy corner stores, provided technical assistance to all three project sites.

Additionally:

- We secured over $60,000 of additional investment to expand the current projects
- Eight presentations were made to state and local audiences, totally over 700 participants.

- A video was developed for store outreach.
- An in-depth evaluation was conducted for the Franklinton site.
- Three journal manuscripts are now in preparation to be submitted to journals and presented at two international conferences this summer.

Goals & Outcomes Achieved

#1 Objective: Increased knowledge and consumption of local specialty crops in food deserts.

1. Objective 1A. Increased access to local specialty crops for community residents: Produce was made available over 1,050 residents in the small village of Chauncey and the over 15,000 residents in the urban neighborhoods around the stores in Akron and the Franklinton neighborhood in Columbus.

a. Objective 1B. Community residents' increased knowledge of nutritional benefits of specialty crop consumption: In conjunction with OSU Extension, Athens County Libraries, OU COMCorps (Americorps Program), fruit and vegetable consumption and healthy living classes were conducted throughout the study period. This included the food is elementary curriculum, and the OSU Extension food and Nutrition program curriculum. In Akron, cooking classes were held in a nearby community garden to demonstrate how to use new products found in stores. In Franklinton, Likewise, Expanded Food and Nutrition Education Program (EFNEP) and Local Matters' Cooking Matters classes were held at Sullivant Gardens and Gladden Community House, both places where Franklinton Gardens had a history of partnership. A post-survey demonstrated that 73% of Franklinton residents understood the nutritional benefits of fruit and vegetable consumption were very important to a healthy diet and 15% said they were somewhat important.

b. Objective 1C. Community residents' increased consumption of specialty crops: Of the twenty-two new varieties of fruits and vegetables were made available, eighteen of these varieties were successfully sold to local residents and are continuing to be ordered and offered. Popular products sold included Tomatoes, Potatoes, Onions, Green Peppers, Watermelon, Cantaloupe, Winter Squash, Summer Squash, Lettuce, and Apples.

#2 Objective: Increased availability of Ohio specialty crops in food deserts.

a. Objective 2A: Identification and use of distributors for corner store networks and rural fresh stop coordination: The Chesterhill Produce Auction was the source of produce for the rural sites, along with a period of a couple of months where a local restaurant "split cases" with the Cee Dee Handy Mart from Gordon Food Service. Three other distributors successfully worked in the Columbus and Akron locations to provide Ohio specialty crops during season and non-local specialty crops off season.

b. Objective 2B: A new community fresh stop will be created to offer fresh fruits and vegetables to community residents located in rural food desert: Cee Dee Handy Mart in Chauncey, Ohio started offering not just fruits and vegetables, but Ohio fruit and vegetables and continued through the Grant period. This is the *only* retail outlet selling fruits and vegetables in the village.

c. Objective 2C: Urban corner stores will start offering or increase offerings of fresh fruits and vegetables to community residents located in food deserts: Three stores in

Franklinton (a Columbus neighborhood) and two stores in Akron started carrying new fresh products. Four of these locations continue post grant period.

d. Increased patronage of corner stores: Patronage was tracked at the three Franklinton stores pre and post offering of fruit and vegetables, controlling for time of day, day of week and time of month. Two stores experienced a significant increase in patronage from the beginning to the end of the demonstration. Broad & Princeton's traffic increased by 37% while traffic at Herbert's Market rose 65%. On average, patronage increased 45% over all three stores despite Family Market's declining participation. Since a number of activities were implemented simultaneously, it cannot be determined that a single factor was responsible for the increase in traffic but store/neighborhood improvements, fresh food offerings and advertising and community outreach are all likely contributors. The third store which did not experience a significant increase is no longer carrying fresh products.

#3 Objective: Utilization of Ohio specialty crop producers resulting in increased consumption and product sales in underserved communities (i.e. food deserts).

a. Objective 1A: Producers/producer groups will be recruited to provide product to each of the three communities: To satisfy the new demand at these retail locations, distributors who served these markets drew from over 110 Ohio specialty crop producers. This includes many underserved farmers (including Amish farmers) in and around Morgan County who do not have as many outlet options for their produce.

Beneficiaries

Three communities were identified for participation, two urban and one rural. An immediate impact, therefore, will be that XX consumers will have increased access to healthy foods. The target populations were SNAP Benefit users, children and seniors, and low income people on the consumer end. Long-term impacts include an increased understanding of the nutritional benefits of these products and how to prepare and even extend the life of these products through processing, which, in the long term, will increase consumption and sales of specialty crops beyond the grant period. Secondary impact of increased utilization of these foods is reduction in negative long-term health outcomes as a result of changed behavior. Ohio ranks thirteenth in the United States in adult obesity. As children and adults have better access and utilization of specialty crops we will begin to reduce the epidemic of obesity and diabetes.

Another immediate impact is that this project worked to connect under-served consumers with over 110 Ohio specialty crop producers. This includes many underserved farmers (including Amish farmers) in and around Morgan County who do not have as many outlet options for their produce.

Finally, this project employed an evaluation design that revealed "lessons learned" and led to identified best management practices to address specialty crop access in food deserts. By sharing these best management practices with stakeholder groups (described later in the work plan) we impact decision-making by consumers, policy development by communities and social action by stakeholders.

Lessons Learned

Lessons learned are both project site specific and more general in terms of the overall effort. In general, we learned the following. Foremost, it is critical to have community partners that are embedded in the community within which you want to create new fruit and vegetable markets and drive local demand to these markets. The more embedded a partner, the greater ease it was for them to identify new retail markets, develop and maintain relationships with retailers, conduct consumer education and generally create a community project. Further, we found greater success with retail store owner who lived in the neighborhood versus those that did not live in the neighborhood. This appeared to stem from a greater commitment of store owners who live in the neighborhood. Another lesson learned was the importance of finding a specialty crop distributor that is willing to work with small retail stores, including teaching store owners and staff how to handle product. Finally, one overwhelming positive experience that is not documented in the goals and outcomes section is that with each of the three communities, new community partnerships were developed around supporting the sale and purchase of Ohio specialty crops. These partnerships will surely go on now that the project is over. In addition, five of the six retail outlets will continue to carry Ohio specialty crops.

Specific problems: Our project partners were not able to recruit as many stores to participate in this project as originally anticipated. Our Akron site has recruited two out of the three anticipated stores and our Chauncey, Ohio site only recruited one out of three anticipated stores. Additional problems at our Chauncey, Ohio site include finding the right equipment at a reasonable price to keep produce at the right temperature and finding a reliable distribution stream for fruit and vegetables during the winter. Finally, at all sites, it is very difficult to track purchase and sale of fruits and vegetables. Small store owners do not have the inventory or point of sales technology to keep solid records. Further, most of the store owners are not used to tracking inventory of these products.

Contact Information

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Project Title: Connecting urban communities with Ohio specialty crops through marketing, nutrition education and support for beginning and limited resource producers

Project Summary

The original intent of this project is to improve the Ohio specialty crop (OSC) industry by capitalizing on the economic purchasing power of urban communities through a marketing campaign, education program and start-up support for new OSC vendors in urban areas. Communities in urban Cleveland suffer from lack of access to OSCs, and less than 1% of the money spent for food within the county goes towards OSCs. The intent of this project was to expand both the supply and demand of OSCs within our

urban communities - to improve the Ohio specialty crop (OSC) industry by capitalizing on the economic purchasing power of urban communities through:
1) promotion and marketing of OSCs in urban neighborhoods
2) education of urban adults and children on the nutrition and other benefits of specialty crops
3) increase the supply of OSCs in urban neighborhoods (via start-up support for new OSC vendors)

Summary of tangible accomplishments.

- Secured partnership with Hyndsight Productions to produce two OSC promotional videos at a 40% in-kind discount. The video are excellent communication tools when screened at events and education presentations. They were crafted to remain current, and will be reused in the next grant cycle.
- Secured partnership with RTA to provide $3,700 of in-kind advertising space on interior RTA trains, increasing our total public transit campaign to 30 exterior bus ads and 50 interior rapid train ads (some of which are still up after 6 months!)
- Held a kick-off event for supporters and press and provided with press packets to promote educational and vendor assistance programs to people who could help us get the word out about these programs to our target audiences. The event garnered news coverage in the Plain Dealer and Freshwater Cleveland and sparked an uptick in growhio.org website hits. Because of the success of this idea, we will hold another kick-off for the next grant cycle.
- Successfully branded the look of our project by hiring graphic designer to create bus and print advertising with elements that we adapted ourselves for additional pieces and will adapt to maintain a consistent look for the next grant cycle.
- Created a page on growhio.org dedicated exclusively to the project. The page serves as a clearinghouse for project information including information about the participating markets and partners, the education program and the vendor assistance program.
- Developed a marketing program including kick-off event, press packets, press releases, Growhio and farmers' market e-newsletters, and community newspaper, online, billboard and public transit advertising.
- Developed an educational curriculum and OSU extension provided training to market managers pursuant to our grant partnership, so that they could adapt the curriculum to educate residents via hands-on cooking classes, chef demonstrations and presentations, depending on the needs of their communities
- Developed a vendor assistance program including outreach, pre-participation survey and sign-up, pre-participation workshop, use of free incubator booth space at markets and direct on-site assistance

By the numbers:

- Screened videos to 4,000 people at:
    - Asphalt Cinema 3 times (300 person audiences = 900 people total)
    - Lakewood Friday Night Flicks 2 times (300 person audiences = 900 people total)

    - Neighborhood Family Practice waiting room 5 days (100 person audiences = 500 total)
    - ParkWorks movies in the park 5 times (40 person audiences = 200 total)
    - Burning River Fest (1,000 person audience)
    - Green Earth Jamboree (30 person audience)
    - Visible Voice Books 2 times (10 person audiences = 20 total)
    - River's Edge (15 person audience)
    - YouTube (435 views)
- Held 56 education sessions (combination of cooking classes, chef demonstration classes and presentations) and collected 152 surveys.
- Attended 4 local events to conduct outreach/promote OSCs at farmers' markets.
- Hosted 12 vendors in our vendor assistance program, 2 of which vended at 2 markets and 8 of which definitely plan to return next season. Vendors sold for an average of 8 weeks each and for a combined total of 109 weeks.
- Distributed 17,000 promotional postcards at area businesses, events, coffee shops, libraries and community centers.
- Distributed 1,000 What's In Season OSC guides to community members.
- Distributed 1,000 Farmers' Market OSC shopping guides to community members.
- Wrote published articles for 3 publications to promote project to community.
- Received write-ups in 4 other publications promoting project to community.
- Advertised with 4 billboards, 80 public transit ads, 3 community newspapers and on facebook.
- Surveyed 620 market attendees through rapid-assessment DOT surveys.

Project Approach

Growhio served as the grant manager and gatekeeper of grant activities to ensure that all grant funded project efforts were directed solely towards the benefit of OSCs and the OSC industry. Collateral materials developed, such as the pocket guide to OSCs at farmers markets and what's in season guide, were focused solely on OSCs and did not promote non-specialty crops. The collateral materials also showcased the industry with pictures of specialty crops. Only OSC producers were allowed into our start-up vendor assistance program, and they could only sell OSCs at the market during their program participation.

Growhio held monthly meetings throughout the grant cycle for representatives of Growhio and each CFMG market to approve deliverables/strategies, divvy up tasks, and discuss, evaluate and identify ways to improve project progress. Growhio also maintained google website (non-public) for all grant participants for storing/sharing project documents, communicating meeting minutes and tracking budget expenses and project goal/outcome progress. Once project activities began winding down, Growhio and the markets began organizing data for EBT sales, CVAP sales, DOT survey results and education survey results into a google spreadsheet. At the conclusion of our activities, we held a report out meeting to discuss our data, performance, takeaways/lessons learned and ideas generated from this evaluation to build on for the following year (outside of the grant cycle). This report out session and follow up discussions served as the basis for the development of our Statewide Outreach report.

1) **Execute a marketing campaign promoting the availability of OSC at Cuyahoga County farmers' markets**

Promotional Video Production:

- August 2010 - Growhio issued an RFP to videographers.
- September - October 2010 - Marketing team (made up of Gwen Forte and Elizabeth Emery from Growhio and 2 representatives from CFMG markets) evaluated and scored proposals.
- October 2010 - Marketing team selected and Growhio entered into a contract with Hyndsight Productions (the top scoring proposer).
- October - November 2010 - Filming at farmers' markets and other sites
- January 2011 - Rough cut of 2 videos complete, reviewed by marketing team.
- February 2011 - Videos finalized and posted to YouTube.
- April 2011 - Additional formats of videos completed by Hyndsight for DVD copies.
- May 2011 - Copies of DVDs in regular form (with both videos and a menu) and looping form (with both videos) completed.
- May 2011 - October 2011 - Growhio and CFMG distribute copies of DVDs at kick-off event for press and supporters and promote video in Growhio newsletter and through facebook, twitter, youtube and Growhio website.

Graphic Design:

- December 2010 - Growhio issued RFP to graphic designers.
- January 2011 - Marketing team evaluated and scored proposals.
- January 2011 - Marketing team selected and Growhio entered into contract with Angela Hammersmith (best proposal at price point required).
- February - April 2011 - Angela designs promotional postcard, bus ad, redline interior ad, billboard ad and flyer template (header and footer).
- April 2011 - 17,000 promotional postcards printed (2,000 in-kind).
- April - June 2011 - RTA bus and rapid advertising campaign; 7,000 postcards distributed across market neighborhoods in Cuyahoga County at public locations such as coffee shops, libraries and community centers.
- July 2011 - Growhio uses look/feel of postcards and ads to develop a What's in Season chart for OSCs and a Farmers' Market pocket guide (with a mini what's in season chart) to serve as handouts for education and outreach.

Advertising:

- February - Growhio adds a page on its website to serve as the clearinghouse for grant program information and post information about the education program and schedule and the vendor assistance program, sign-up and pre-workshop survey.
- March -April 2011 - Growhio worked with CBS Outdoor (which handles advertising with RTA) to establish partnership for RTA advertising;

secured in-kind donation of 50 redline interior ads (payment for production costs only was required) and campaign of 30 exterior queen bus ads and 50 interior redline ads.

- April 2011 - Growhio/CFMG wrote articles and press releases about its ODA grant programs.
- April 2011 - Growhio/CFMG planned kick-off event to promote educational and vendor assistance programs to supporters, press and others who could help us get the word out about these programs to our target audiences.
- April 2011- June 2011 - Articles about Growhio/CFMG's ODA grant programs were published in Growhio's quarterly newsletter, EcoWatch, Kamm's Corners Magazine, the Cleveland Plain Dealer, Fresh Water Cleveland, Green City Blue Lake and Crain's Cleveland (blog).
- May 2011 - Growhio/CFMG held kick-off event at local restaurant and supplied attendees with press packet including copies of press releases, educational program flyer, vendor assistance program flyer, DVD, postcard and "how you can help" document. All invited guests received an electronic version of the press packet via email.
- May 2011 - CFMG began advertising in community newspapers.
- May 2011 - CFMG began billboard advertising in select CFMG neighborhoods.
- August 2011 - CFMG concludes billboard and community newspaper advertising.

2) **Educate children and adults on the nutritional benefits of OSC and where they can be purchased**
    - November - December 2010 - Education team (made up of nutritionist from Ohio State University Extension - Cuyahoga County (OSUE) and 2 representatives from CFMG markets) began researching the education program and developed program outline.
    - January 2011 - OSUE presented outline to Growhio/CFMG for feedback.
    - February 2011 - Education team identified cooking classes as a target inclusion in the education program for the East Cleveland and Slavic Village neighborhoods.
    - March 2011 - Education team developed curriculum that could be used for hands-on cooking classes, presentations without cooking so that managers could adapt the program to suit the needs of their market neighborhoods.
    - April 2011 - Education team held cooking class and food preparation training for market managers.
    - April 2011 - Market managers began scheduling education presentations/classes.
    - May 2011 - Education team completed powerpoint presentation, surveys and handouts for education classes, which were finalized by marketing committee.
    - May - June 2011 - Market managers began giving education presentations/classes in their market neighborhoods.

- June - September 2011 - Market managers continue giving education presentations/classes and conduct pre and post-surveys of education program participants.
- July 2011 - Growhio and two market managers table a booth at Burning River Fest, a sustainability event in Cleveland which attracted 5,000 attendees. We passed out the What's in Season charts and Pocket Guides. We also created a "What's Growing?" photo booth, which was a plywood painting of a broccoli stalk, carrot, beet and tomato, with cut-outs for people to show their faces through and get their picture taken.
- September 2011 - Growhio and two market managers table a booth at Ingenuity Fest, which attracted 30,000 attendees. We handed out the What's in Season charts and Pocket Guides.

3) **Increase the supply of OSC in urban communities by providing support to limited resource / start-up producers**
    - October 2010 - Growhio/CFMG decided to offer community vendor assistance packages ("booth incubators") at each market for the entire spring-fall market season; standard booth incubator requires a furnished space (tent when outdoors, table, chairs and a booth sign).
    - October - November 2010 - Growhio developed vendor program pre-questionnaire and creates an electronic version through survey monkey; survey is posted on Growhio's website in February.
    - March - April 2011 - Growhio with support from CFMG developed vendor assistance program workshop for program participants to view online prior to starting program.
    - March - June 2011 - Prospective participants sign up for vendor program online and take the required pre-questionnaire; market managers work directly with vendors to determine if they qualify for the program and if so, arrange for their participation.
    - May 2011 - Vendor workshop was posted online and program participants began taking the workshop virtually.
    - May - June 2011 - Market managers provide one-on-one follow-up support to vendors who have taken the workshop.
    - June - September 2011 - Market managers provide guidance to vendors in the program as needed.

Goals & Outcomes Achieved

1) **Execute a marketing campaign promoting the availability of OSC at Cuyahoga County farmer's markets**

    - **Performance Measure 1.1** - Each Market Manager will measure the market volume through weekly surveys of farmers' market attendees. Benchmark 1.1- **25%** of new attendees that are surveyed will indicate that they were persuaded to attend the farmers' market through Growhio's marketing campaign.

- **Results:** 620 people surveyed, 404 of which were new attendees. 105 people or **26%** indicated persuaded to attend farmers' market through Growhio's project marketing or outreach.

- **Performance Measure 1.2** - The Growhio web site will be monitored to track its increase in traffic due to the marketing campaign. Web hits will be followed from the start of the program through project completion. This will inform Benchmark 1.2 below. Benchmark 1.2 - To increase the number of Growhio web site hits by **30,000** throughout project implementation. Monthly web traffic averages from October 2010 - February 2011 will be base of comparison for monthly increases.
- **Results:**
    - Overall site
        - October 2010 – February 2011 – 5,506 hits
        - March 2011 – September 2011 – 14,769 hits
        - Increase in hits: 9,263 or 73%
        - Total hits: **20,275**
    - ODA Grant page
        - October 2010 – February 2011 – 165 pageviews
        - March 2011 – September 2011 – 1,352 pageviews
        - Increase in pageviews – 1,187 or 78%
        - Total pageviews: 1,517
    - Pageview spikes:
        - March 28 – 111 pageviews – Growhio Spring Newsletter
        - April 11 – 27 pageviews – invitation to kick-off
        - April 14 – 26 pageviews – invitation to kick-off
        - May 3 – 33 pageviews – kick-off event
        - May 4 – 34 pageviews – kick-off event
        - July 27 – 26 pageviews – Burning River Fest

- **Performance Measure 1.3** – Each farmers' market with EBT capabilities will evaluate EBT sales following the 2011 season. Benchmark 1.3 – Each farmers' market with EBT capabilities will achieve a **30%** increase in EBT sales from the previous year.
- **Results:** EBT sales increased **94%** from the previous year for markets that had EBT in 2010 and 2011, and increased 101% for all markets from previous year.
    - 236% increase – Broadway Farmers' Market
    - 117% increase – Kamm's Corners Farmers' Market
    - 100% increase – Gordon Square Farmers' Market (no EBT in 2010)
    - 100% increase – Lakewood Farmers' Market (no EBT in 2010)
    - 52% increase – Tremont Farmers' Market
    - 43% increase – Downtown Farmers' Market
    - 29% increase – Coit Road Farmers' Market

2) **Educate children and adults on the nutritional benefits of OSC and where they can be purchased**

- **Performance Measure 2.1** - Participants in the educational presentations / workshops, put on by Growhio Educators, will be given a survey prior to the education workshop, and afterward. The survey will briefly ask participants about their level of knowledge with regards to OSC, their desire to purchase them, and likelihood of purchasing OSC at a participating Growhio farmers' market. This will inform Benchmark 2.1 and 2.2 below.Benchmark 2.1 - **25%** of participants in educational presentations / workshops will have increased nutrition knowledge as demonstrated on pre and post survey answers. Benchmark 2.2 - **25%** of participants in educational presentations / workshops will demonstrate their increased desire to purchase Ohio specialty crops.
- **Results:** 104 participants took pre- and post-surveys. Based on what they learned:
    - 58 people (**56%**) said they would plan on making more meals with OSCs
    - 79 people (**76%**) said they will prepare or eat more OSCs on a regular basis
    - 41 people (**39%**) said they will definitely try using herbs, garlic, onions or peppers to flavor meals in place of salt
    - 44 people (up from 15 in initial surveys) (**42%**) said OSCs are very affordable
    - 75 people (**72%**) said they are more likely to shop at a farmers' market

3) **Increase the supply of OSC in urban communities by providing support to limited resource / start-up producers**

- **Performance Measure 3.1** - Community Vendor Packages will be administered to seven participating markets. Limited resource / start-up vendors will be solicited to sell their OSC at the farmers' markets. The number of vendors taking advantage of the Community Vendor Package will be recorded each week at each of the participating farmers' markets. Benchmark 3.1 - 3 limited resource / start-up OSC vendors will sell at each participating farmer's market each week. This would be a total of **21** new vendors selling out of the 7 participating farmers' markets.
- **Results: 12** vendors participated in the program and sold at participating farmers' markets.

- **Performance Measure 3.2** - Each Market Manager will measure the market volume through weekly surveys of limited resource / start-up OSC vendors to measure the effect of the Community Vendor Package and marketing campaign on their business. This will inform Benchmark 3.2

below. Benchmark 3.2 - **75%** of vendors will indicate that their market sales "exceeded expectations" [did well / great] each week.

- **Results: 77%** Vendors indicated their sales met or exceeded expectations and **11%** Vendors indicated sales exceeded expectations.

Beneficiaries

Beneficiaries of our project included 12 specialty crop producers, who received direct support and resources through our vendor assistance program, as well as the more than 25 other specialty crop vendors at our 7 participating farmers' markets, who realized increased sales as a result of our marketing and outreach efforts to attract more consumers to the markets for OSCs. Beneficiaries also included the more than 5,200 consumers who were introduced to OSCs, their benefits or how to prepare them through our education program.

Lessons Learned

Our marketing campaign, which was intended to reach 939,000 residents of Cuyahoga County, has gained an exposure of 2.9 million people. This means that 2.9 million people, through an online or printed article, YouTube video, postcard or newspaper, billboard, facebook, RTA bus or rapid advertisement, have been exposed to our message promoting OSCs at area farmers' markets. As we reinforce this message over the next grant cycle, more and more people will begin to make the connection between OSCs and healthy produce, healthy people and healthy connections - available at their local farmers' market; and, they will shop at the markets more frequently, which will lead to greater sales of OSCs. Sales are up at our participating farmers' markets by $20,000 this year. Although there are many contributing factors to this increase, our DOT survey results showing that 26% of new attendees were persuaded to visit the markets via our project marketing and outreach indicates a positive connection between our project efforts and increased sales at the markets.

Twelve limited resource/start-up OSC vendors participated in our vendor assistance program, and no more than half indicated that they would have been able to go to market without our program. Eight vendors plan to return to market next year and 2 may return next year, bringing a great range of additional OSC vendors to our participating markets. Our target for the vendor assistance program was to reach 21 new vendors, which we did not reach, in part because this year's weather proved extremely difficult for start-up farmers, many of whom indicated an interest in participating in the program, but ultimately did not have enough product to feel it was worth their while. We also realize that we need to recruit vendors as early as January to ensure they are aware of the program before planning their crop and ordering seeds. We were unable to do that for this project because we needed time to develop the program. Were this program to continue in the next cycle, we would use the program in place with minor adjustments and begin recruiting vendors as early as December to get a better turnout. Finally, the turnover we had with market managers this year prevented those markets from being able to recruit program participants until it was well into the season, which prevented those markets from being able to recruit enough vendors.

The goal of our education program was to reach 3,000 consumers, which we exceeded. We realized that a one-size-fits-all approach does not work for seven different neighborhoods, or for all residents, for the education program. Some neighborhoods benefit from a targeted hands-on approach (cooking classes) while others benefit more from broader and more extensive outreach. Thus, we expanded our original education plan from a series of presentations to also include video screenings, cooking classes, chef demonstrations and talks, and one-on-one outreach at local events, for a total of 80 different contact events reaching an estimated more than 5,200 people. The What's in Season OSC chart by far received the most positive feedback from people, who indicated that it taught them something new and would be useful in planning what OSCs to buy. Because of the overwhelming positive response to the chart and one-on-one outreach at local events, we will continue one-on-one outreach at local events and to distribute the chart in the next grant cycle to promote OSCs to local residents.

Contact

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Project Title: Develop a mobile garden unit for youth education on specialty crops

Project Summary

Four years after the economic crisis that ensued in Clinton County when DHL, the areas larger employer, left the community Grow Food Grow Hope met its goal to educate the community on the importance of the nutrition and the benefits of gardening. With nearly 50% of the community out of work our concern was that adults and children would lack access to adequate healthy and fresh food.
As a result Grow Food Grow Hope brought the Mobile Garden Learning Center to classrooms and youth centers throughout Clinton County during the spring of '11 and the '11-'12 school year. Children departed from their daily school routine and emerged into the world of nutrition. They gained basic garden knowledge through books, games, hands on activities and garden experiences. The children were well equipped with tools and resources which they shared with their parents. There are some children whose parents started gardens at home or chose to join one of our community garden sites. Some schools enjoyed our program so much that they decided to create outdoor learning laboratories for their students.

Project Approach

We began our project in January 2011 by securing a truck to become our Mobile Garden Unit. In an effort to ensure sustainability of the project we opted not to purchase a flat-bed trailer for our Mobile Garden Learning Center. Instead, we built a shed on the back of the truck to store tools, transport plants, and lessons back and forth from Wilmington College to the preschools and elementary schools. Along with the shed, we constructed

garden beds in the back of the truck as well as partnered with schools to create outdoor learning laboratories at preschools and elementary schools to conduct demonstrations. Beginning in February we developed lessons to teach youth about nutrition and growing. Lessons were developed for preschool and elementary school children. We printed literature, flyers and public materials and posted them at the schools and around Clinton County. Beginning in March we contacted school and child care facilities to begin carrying out our pilot lessons. For our lessons we brought our mobile garden beds to the schools so that the children could start to experiment with growing. We also begin constructing garden beds at the school as a part of their outdoor learning laboratories. By April we began teaching children how to transplant seeds and how to care for plants. From May to October of 2011 we developed survey questions to test the effectiveness of our program and to identify our areas of strength and weakness. We continued to conduct visits to schools and childcare facilities, presenting and refining our lessons. From October of 2011 to December of 2012 we conducted lessons and gathered data. We built garden beds throughout the community and held youth focused garden nights at sites throughout Clinton County in addition to our weekly visits to schools. Beginning in September of 2012 we started analyzing data to identify the level of success. We knew that many students learned from our Mobile Garden Learning Center however, the data helped us identify which lessons were successful for which age group and which lessons needed additional refinement.

Goals & Outcomes Achieved

The goal of our Mobile Garden Learning Center was to transform youth into viable consumers of fresh food and produce. In two years it is difficult to achieve this goal because children will have to grow up and buy the food. However, we can track how much youth are learning about food and how important fresh food is to each child. From January of 2011 to December of 2012 225 youth were surveyed about their understanding of nutrition and local produce. A pre survey was conducted before each lesson and a post survey was provided within 48 hours of the lesson.

Our two large goals were to teach children about the importance of nutrition and to transform youth into consumers of fresh produce. We believe that we have been able to achieve these goals. Our youth are more interested in fresh food and our youth tell us that they enjoy gardening. Through weekly lessons at schools and hands on gardening activities youth have started engaging themselves in the food production process. We have started to see youth eat food right out of gardens and have started to entertain food and garden specific questions from youth.

Our surveys revealed that 62% of children like vegetables initially, but after our lessons that number increased to 74%, a 12% increase. While not a large increase our initial assumption was that more children didn't like vegetables. The number of children who reported eating vegetables was high as well, 51%, but after our lesson 64% reported eating vegetables. While only a 13% increase we have deduced that the understanding of fruit and vegetable changes after we interact with the youth and some children have a better understanding of what they are eating.

Our lessons also focused on scientific information that aligns to state standards, this is where we saw significant gains. When asked if pollination is important 57% of youth initially reported yes, but after our lesson the number reach 83%. This significant gain

demonstrates that youth are able to learn not only the importance of fresh food and produce, but how that food is "created." Youth also reported large gains in understanding food groups. When asked to name one food groups, preschool students initially had trouble, as 45% of preschool students could name a food group, but that number doubled to 70% after our lesson. Youth also reported significant gains in learning about the importance of nutrients in soil. When asked if vegetables can grow in any type of soil 28% of children initially answered correctly, but after the lesson that number increased to 48%.

Something that shocked our program coordinators was the response to the question; would you like to have a garden? We initially saw a decrease from 65% down to 39%. This decrease was puzzling in reviewing qualitative data we have determined that the very definition of garden, just like vegetable, changes after our lesson. We learned that after our lesson some children learned that they did have a garden or already participated in one of our community gardens. We were also puzzled by a small gain in the number of children reporting that they eat healthy meals. We only saw an increase from 76% to 78%. Because the youth we serve receive most of their meals from parents or from the free and reduced lunch program we have learned that the youth have very little control over what they eat. To rectify this problem we need to engage more youth, and their families, in our community garden projects.

Beneficiaries

The immediate beneficiaries of our program were the 7992 youth and more than 30 teachers who received our lessons. Additionally, the parents, siblings and family members of the youth were impacted by our resources that we sent home with the youth. Our truck, the Mobile Garden Learning Center, has also made an impact on many. It is highly visible and often catches the eyes of members of the community who admit to thinking about local produce when they see the truck driving around town.

Lessons Learned

The Mobile Garden Learning Center for Wilmington College Grow Food Grow Hope has been a success, we have engaged more youth and we have transformed many lives. We learned that we don't give our youth enough credit, they know a little about nutrition and fresh produce, but they are hungry for more information. Youth, while they don't make the initial purchasing decisions, have a large say on what is purchased in a home, if a child doesn't want to eat something it usually isn't purchased again. By making produce "cool" more youth are more likely to eat them.

We struggled initially to establish a Mobile Garden Learning Center because we were limited by the comfort level of our employees. Employees weren't comfortable driving a truck with a trailer behind it. Additionally, we struggled to find parking for our Learning Center. Our end product, a truck with a "barn" on the back achieved our goals.

Our Mobile Garden Learning Center has been managed by several employees over the course of two years. Because there have been so many caretakers the project has morphed from a program to the center piece of all of our youth programs. All of our youth programs utilize our Mobile Garden Learning Center Model. Even when we are utilizing a permanent outdoor learning laboratory the Mobile Garden Learning Center

serves as a way to transport our program and transform an ordinary space into a classroom.

Contact

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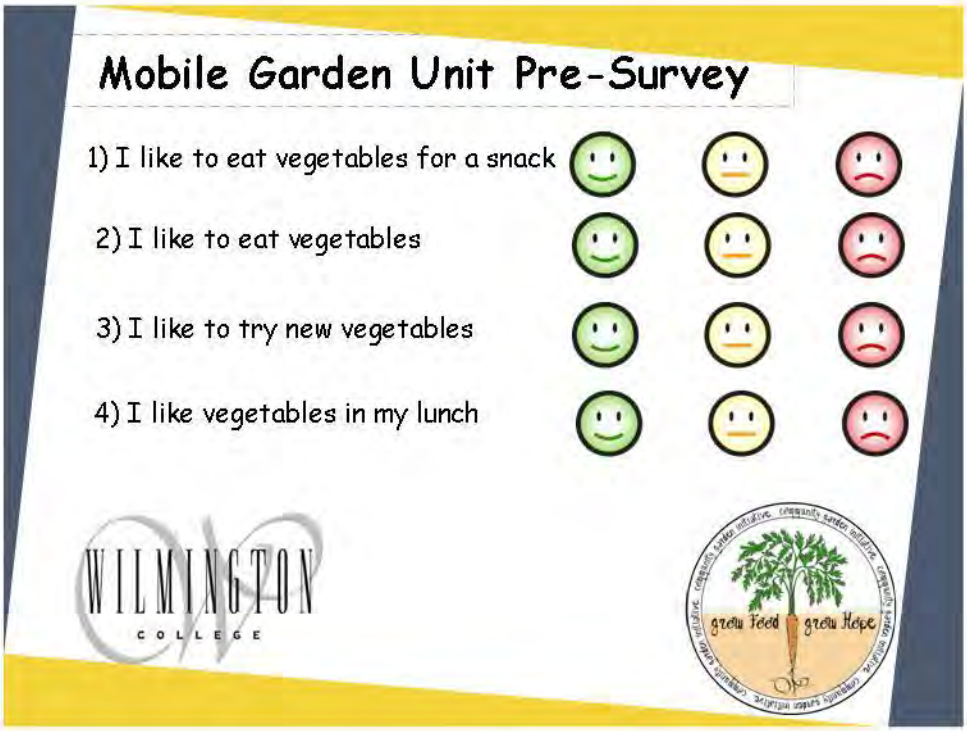
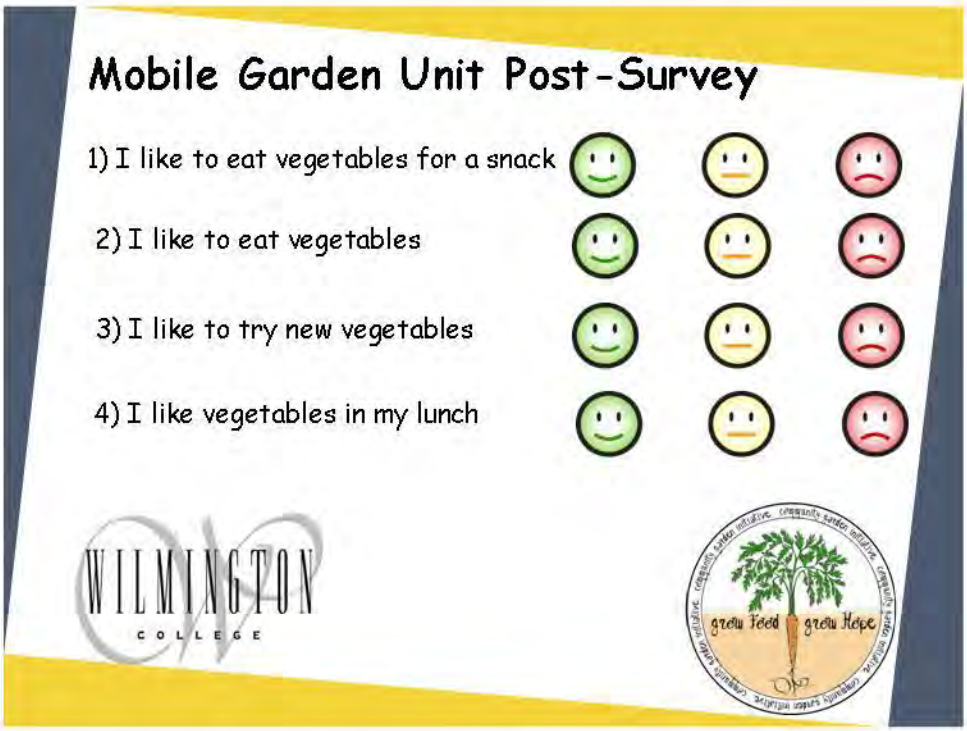
Additional Information

www.growfoodgrowhope.com
http://www2.wilmington.edu/service-learning/GrowFoodGrowHope.cfm


Mobile Garden Unit Pre-Survey
1) I like to eat vegetables for a snack
2) I like to eat vegetables
3) I like to try new vegetables
4) I like vegetables in my lunch
WILMINGTON
COLLEGE
grow Feed grow Hope


Mobile Garden Unit Post-Survey
1) I like to eat vegetables for a snack
2) I like to eat vegetables
3) I like to try new vegetables
4) I like vegetables in my lunch
WILMINGTON
COLLEGE
grow Feed grow Hope


GROW
FOOD
HOPE

Dirty Dirt

Cowboy Carrot & Cowgirl Carrot


Rosie Tomato


Super Soil


Caesar

Tucker Tomato


Sage
Purple
Oregano
Parsley
Chives

FINAL REPORTS
(Approved October 2012)

Project Title: Food safety education related to state and federal food safety initiatives under development

Project Summary*:*
The goals of this proposal focus on helping the intended audience understand: the science behind Good Agricultural Practices (GAPs), specifically in the areas of water, traceability, composting, and good hygiene practices; GAP standards to be met for certification under the developing Ohio Produce Marketing Agreement (OPMA), a state-wide food safety inspection and certification program; and the mechanics of a certification process.

The public perception of fresh produce has historically been that it is good, wholesome, and safe. Continuing incidences of food-borne pathogens found on domestically grown and imported produce causing illness and even death, have shaken this perception and strained the public's trust in our food system. The food safety training offered during the 2011 Ohio Produce Growers & Marketers Association (OPGMA), augmented with training during the 2011 OPGMA Summer Tour & Field Day and articles in the *OPGMA Today Newsletter*, provides Ohio growers with the grounding needed to help them avoid being the source of food borne safety risks, and document their production and distribution practices when problems do occur.

The 2010 Ohio Specialty Crop Block Grant effort built on previous years' efforts in several ways. First, it increased the total time devoted to food safety education – from 5.75 hours the previous year to 6.25 hours in 2011. More importantly, the 2010 grant facilitated the incorporation of six expert Ohio State University (OSU) researchers and educations into the OPGMA Congress education program (Congress is the annual convention for Ohio's fruit and vegetable growers, packers, and marketers). Finally, it exposed attendees to the standards and mechanics of a food safety certification effort, using OPMA as the exemplar. Those directly involved in the food safety efforts at Congress, Field Day and in newsletter articles included: Bob Jones, The Chef's Garden Inc; Dr.Karl Kolb, High Sierra Group; and Eric Barrett, Dr. Doug Doohan, Hal Kneen, Mark Koenig, Ashley Kulhanek, and Robert McCall, OSU.

Project Approach

- We found that it is difficult to collect email addresses from the farming community, as many do not have them, and those that do were reluctant to supply them. Therefore, we could not obtain enough data via an online survey to yield meaningful results. To address the issue at a subsequent Congress, we relied on on-site pre and post session surveys.

- OPGMA hosted three sessions (a 60 and a 75 minute session and a 4-hour seminar) at the 2011 OPGMA Congress. Total attendance was over 300, representing several hundred operations.
- Almost 200 individuals attended the 2011 OPGMA Summer Tour & Field Day event during

which they heard a presentation on food safety issues.

- Food safety articles, written by Dr. Karl Kolb, were published in both the Winter and Spring issues of the *OPGMA Today* newsletter. This publication is distributed to universities and hundreds of farming and packing operations.
- There were not problems or delays in implementing the planned efforts supported by this grant.

Goals & Outcomes Achieved

Performance Measures & Benchmark

In meeting a similar goal for last year's supported effort, about 300 attendees [representing several hundred farms] gained an understanding of food safety issues, the importance of food safety for the consumer and for the produce industry's future during last year's Congress and summer tour. By offering the Congress food safety sessions at no cost to growers, we anticipate reaching a wider audience with updates on the issues as well as a summary of the development of the Ohio Produce Marketing Agreement (OPMA). In addition, coverage will be given to the continuing development of the National Leafy Greens Marketing Agreement under USDA's auspices and to FDA's efforts to develop relevant food safety regulations. We anticipate up to 100 growers [/farms] will gain an understanding of the Good Agricultural Practices that will serve as the foundation for the OPMA food safety certification. An electronic post-program survey will be conducted with those that attend the sessions to gauge the level of comprehension. In addition, the food safety messages provided during the Congress and Summer Tour programs will be augmented with articles and news pieces in the OPGMA printed and electronic newsletters and on its web site.

For the reason listed under the corrected Project Approach statement, adequate quantitative data was not collected. If we can extrapolate from data collected from an alternative sampling protocol as a subsequent Congress:

We asked 2012 OPGMA Congress attendees who attended any of the food safety sessions state whether they had a better general understanding of food safety issues at the close of the session than before it started. We then asked respondents to rate their level of understanding of the 3 specific topics both before (pre) and after (post) the session on a 5 to 1 scale (5 = very knowledgeable, 1 = just starting to learn).

The 105 respondents that said "yes," i.e. that they had a better general understanding of food safety issues at the close of a food safety session:

- Core Food Safety Concepts ratings: Pre = 3.0; Post = 4.0
- How to Implement GAPs: Pre = 2.6; Post = 3.7
- OPMA & Certification: Pre = 2.3; Post = 3.7

The 6 respondents that said no, that they did not have a better general understanding at the close of a session:

- Core Food Safety Concepts ratings: Pre = 3.5; Post = 3.2
- How to Implement GAPs: Pre = 2.7; Post = 2.8
- OPMA & Certification: Pre = 2.0; Post = 2.3

We reached 300 industry stakeholders during the 2011 OPGMA Congress, another 200 during the 2010 OPGMA Summer Tour & Field Day, plus 400 member stakeholders through our printed *OPGMA Today* newsletter and e-newsletters. Combined, these stakeholders represent hundreds of farming and packing operations, and marketers in Ohio.

Eighty-six individuals attended the 4-hour seminar titled Food Safety Part 3: Training, Education & Implementation. This session was presented by the OSU faculty; the seminar description: "This seminar covers the 'how to' of the standards, how to construct a GAP, a brief history of food safety, the four major categories of standards -- water, inputs, handling practices, traceability -- and the science behind the rules, and suggestions for implementing the standards on the farm. This session is open to all."

Those completing the 4-hour seminar received a certificate of completion. The instruction supplied during the seminar serves as an education foundation for all three tiers of the OPMA food safety certification program, and meets the criteria for those who will apply for a Level 1 (local retail, i.e., farm markets, farmer's markets, etc.) OPMA certification. Furthermore, this education supports other GAP certification programs and, most importantly, expressed the increased need for producers and handlers to give food safety a greater priority in their operations.

Beneficiaries

The beneficiaries of this effort are Ohio growers and consumers.

Lessons Learned

Growers and food handlers, like most people, are often motivated to action by threat of the imminent. Large and some medium-sized Ohio operations are already grappling with food safety and certification issues required of them by their retail customers. Smaller operations, which have little time and few dollar resources dedicate to safety issues, and may sell to outlets that do not yet require certification, need continual message reinforcement and guidance on the path to food safety practices and certification. The educational needs by all operations, regardless of size, are never-ending and programs designed for this audience should be perpetual.

Contact*:*

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Project Title: Development of a science-based food safety certification program

Project Summary

Currently there are no national- or Ohio-recognized food safety certification programs or voluntary marketing agreements for Ohio growers. But there are a plethora of third party certification programs, typically using different criteria for certification. OPMA is a science-based food safety program that encompasses a three-tiered certification approach and incorporates the efforts of a number of technical review committees (TRCs) made up of growers, academics, and other industry professionals. These TRCs continue developing Good Agricultural Practices (GAPs) for the different produce segments, production environments, and farm cultures that can be found in Ohio.

The continuing instances of produce-borne pathogens causing illness and even death around the country have heightened consumer awareness of food safety issues. Produce wholesalers and retailers, both large and small, are well aware these instances, the consumers' mounting concern, and their own legal foot prints and are initiating new or "tighter" certification requirements for their growers. A significant challenge for growers, especially those supplying more than one wholesaler/retailer, is that the GAPs that serve as the foundation for a given certification program typically very among third-party certifiers. A second major challenge, especially for smaller growers, is that the third-party certifications are typically, "one size fits all." OPMA addresses these issues for all Ohio growers, allowing them to be recognized (certified) for their food safety management efforts in an economically sustainable manner.

OPMA builds on the project's first-year efforts, which validated the need for a standard to promote and protect Ohio Agriculture. The goal is to establish a voluntary food safety marketing agreement that's based on sound science, applicable to all levels of farming, and the wide diversity of Ohio agriculture. Much of the past and current efforts have been conducted by Dr. Karl Kolb.

Project Approach:

The "Three Tier" scheme is designed to allow a number of objectives to be met at different levels of farmer desired participation. With this approach it is important to understand that the standards do not change at each level, they are implemented based on a risk analysis using a HACCP process. This is a concept favored by the Global Food Safety Initiative and true food quality programs.

The research regarding this multi-tier approach has been conducted under the USDA program NIFSI, Doctors Le Jejune and Doohan (OSU), (peer reviewed and published) confirmed the need for a tiered approach to food safety.

The Three-Tier Approach is best outlines in this chart:

Tier	Operators	Standard	Requirements
Tier I	Recommended for	Annual four	Voluntary

	operators with direct farm sales, roadside farm markets, farmer's markets, CSA's (Community Supported Agriculture) and other operators who do not wish to participate in tier levels II and III but desire to demonstrate the Ohio food safety standard.	hours of GAP training and implementation of the core standards. Grower signs affidavit affirming the application of the standard.	compliance and random inspections. OPMA certificate states this is a Tier I member.
Tier II	Recommended for operators who require a certification with inspection.	Annual four hours of GAP training for principles.	Mandatory compliance and scheduled inspections
Tier III	Recommended for operators who require more than the Tier II certification. This level supports a variety of standards and so is stated on the certificate. For example, a customer requests that a grower producing Green Onions be in compliance with the FDA high risk standard. These additional requirements would be added to the inspection and noted on the certification. There are many specialized standards throughout the industry that may be added to the scheme. (At a later time GFSI level inspections may be added to OPMA when ISO 65 is achieved.)	Annual four hours of GAP training for principles.	Mandatory compliance and scheduled inspections

Note 1: Tier I is designed for the home grower or the grower with a small yield. It is low cost and entry level. It is designed to get folks involved in food safety. All certificates and their classification is noted on the web site, www.opma.us, so that those accepting the certification for food safety purposes are aware of the certification limitations.

The number of farmers to participate in the program is unknown. The listening sessions conducted in the first year of the grant totaled approximately 1,500 growers of all types and sizes across the entire state of Ohio. This may an indicator of participation. However, with the exception of the total number of Ohio growers, no other predictors have been employed.

- The following number of farmers will be certified by the close of the 2011 grant year.

  Tier I: 10, Tier II: 1

- Worked with the OPMA Board and Technical Review Committees to adapt the certification process, aligning it for ISO 65 certification. This certification is internationally recognized for the robustness and relevancy of certification programs that it recognizes. An ISO 65 certification will give OPMA instant credibility when working with food wholesalers and retailers, especially those outside the state of Ohio.
- The three-tier certification scheme was formalized and specific standards and practices for each tier are now outlined and utilized.
- Spent considerable time with the Ohio Department of Agriculture exploring and evaluating existing mechanisms for granting legal recognition to OPMA as a voluntary marketing agreement within the state of Ohio. When it was discovered that there is currently no mechanism for enacting a voluntary marketing agreement, we enlisted the aid of the Ohio Farm Bureau Federation (OFBF) to work with the state legislature to enact such a mechanism. The effort is continuing. Note that no grant monies have or will be spent on this effort.
- Conducted a training session for inspectors. Ten candidates have been trained and one has conducted an on-farm food safety audit (with supervision).
- Officially begun the OPMA certification effort. One farm was OPMA certified by the close of the 2010 grant year.
- Producers, packers, marketers, commodity groups, and other stakeholders were informed and engaged through various marketing efforts, including a website, and educational programs.
- Business practices were refined to manage the certification process.

Goals & Outcomes Achieved

Volunteers were requested from each of these agricultural communities and organized into "minor Technical Review Boards "(mTRB) with each mTRB reflecting a different type of farming such as muck or organic, for example. These focused groups (mTRB) were provided a core set of GAP standards and asked to supplement them with standards particular to their portion of the industry. (This process also defused confused conflicts among competing standards and other requirements from various agricultural agreements.) Each group studied the GAP standards, their farming operations and provided to the project manager a list of those things common to their farming practices bearing on food safety. These were then converted into practical standards and added to the core set of GAP standards.

Each mTRB is chaired by a representative of specific agricultural community. This chair sits on the permanent oversight committee referred to as the "Major Technical Review Board" (MTRB) and the MTRB is chaired by a scientist of their choosing.

The MTRB functions to validate new standards, review current standards for applicability, review emerging science, regulatory code and industry practices for inclusion into the marketing agreement.

Without the approval of a National leafy greens standard some parts of the current set of standards have been developed from the California Leafy Greens Marketing Agreement. The set of standards now employed is a working group of expectations to be developed into a standard from field data (certification inspections), developing second and third party agricultural standards, and emerging information from the Food Modernization Act.

The first published standard is expected to be in final form in calendar years 2013/2014.

The OPMA certification program is functioning and one farm operation has been certified. More audits were scheduled for the next grant year.
The beneficiaries of this effort are Ohio growers, packers, retailers, and consumers.

Beneficiaries

An economic study would need to be undertaken dedicating time and financial resources not available to this group. A number of nationwide articles and USDA studies have cited the impact of recalls involving levels 1, 2, and 3 illnesses, productivity and economic losses. No such endeavor has taken place with regard to the impact of the OPMA at full implementation. The goals of the OPMA when conceived were to "Promote and Protect" the Ohio farmer and their consumers. No potential economic impact study was undertaken at the start of this project as funding was not available.

The beneficiaries of this effort are Ohio growers, packers, retailers, and consumers.

Lessons Learned

The "wheels" of state government can move agonizingly slow. OFBF and OPMA continue to work with the Ohio Senate and House to enact legislation that will create a legal procedure for creating voluntary marketing agreements in Ohio. The sentiment in both houses is favorable, but scheduling glitches have precluded action. Furthermore, efficiently engaging minority groups, like Amish and Mennonite farmers, is difficult due to technology barriers and cultural practices. No monies from the grant, OPMA, or any other source associated with this grant is or has been used by Dr. Kolb, OFBF, or anyone else associated with the grant for lobbying or political activities.

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Project Title: Increase awareness of Ohio grown produce through advertising and a farmers' market directory

Project Summary

This project increased awareness of Ohio's specialty crops through promotional and educational activities. It allowed growers to participate in activities with little to no cost while increasing awareness and sales. Co-op advertising allowed Edible Columbus and Ohio Magazine to offer discounted rates and a dedicated section to specialty crop growers. Ohio Magazine also featured a passport program to increase visits to direct marketing outlets. The passport program was a great way to create awareness and increase visits to these direct marketing outlets.

Printing the farmer's market directory, produce availability chart and poster was a vehicle to educate consumers about Ohio's specialty crops. The Directory assisted consumers with locating the farmers markets throughout the state. The produce availability chart was distributed at consumer events with the Ohio Proud kitchen, Ohio State Fair as well as at industry trade events like the Farmers Market Managers' annual meeting and Ohio Produce Growers Annual meeting. The chart was also popular at educational programs held regionally throughout the state such as the Market Ready trainings. The produce availability posters were provided to Ohio Grocer's and school food service directors to assist them with the timing of purchasing Ohio specialty crops.

Project Approach

The overall goal of this project was to increase the competitive advantage of Ohio's specialty crops through promotional and educational activities.

Promotional Materials

ODA partnered with industry stakeholders like Ohio Produce Growers Marketing Association (OPGMA) and Farmers Market Managers Network (FMMN) to gather input for the promotional materials and then contracted with a designer to create the chart, poster and farmers market directory. The promotional materials were printed and distributed to Ohio produce buyers, farmers' markets, school food service directors and industry meetings. The farmers market directories were distributed at consumer events such as the Ohio State Fair and at industry trade shows.

ODA has a data base of farmers markets who list their location, hours and types of produce available at the market. Most of these locations sell specialty crops or processed products made from specialty crops. ODA provided in-kind staff hours to cover the expenses associated with the non-specialty crops listed in the directory. It was determined that 25% of the in-kind staff hours would be allocated toward the farmers market directory portion of this project.

ODA's food safety division also requires farmers markets to register their markets annually. This registration provides the location, hours and types of produce available at

each market. Using both of these vehicles enabled the ODA staff to monitor and ensure that those farmers markets that were listed in the Farmers Market Directory were selling Ohio specialty crops and therefore enhancing their competitive advantage.

Co-Op Advertising

ODA worked with the Ohio Magazine and Edible Columbus to create an advertising campaign to highlight Ohio's specialty crops. These magazines also offered special ad rates to Ohio's specialty crop growers. Nine markets and six wineries participated in this program. ODA shared this program with Farmers Market Managers at industry meetings and through mass e-mails on ODA's and Ohio Proud websites. Magazine representatives also presented their packages at industry meetings.

The passport program was a special feature in the Ohio Magazine to encourage consumers to visit at least six farmers markets or Ohio wineries. The passport ad was featured in the June issue of the Ohio Magazine. In addition to the passport, the Ohio Magazine featured a special section about farm and farmers markets to promote Ohio's specialty crops. Ohio farmers markets and wineries were invited to participate in this program through ODA and Ohio Proud websites, Farmers Market Managers Network and the Ohio grape industries program. Once the markets and wineries committed to the program, Lori Panda managed the design and printing of all advertisements and signage for the passport program. The participating 100 markets and wineries were listed on www.ohioproud.org and the Ohio Magazine's website so consumers knew where to visit with their passport. The magazine ads directed consumers to the website to view the list of participating markets and wineries. Once consumers visited six sites, they were instructed to mail the passport to ODA to receive their Ohio Proud passport gift package. The Ohio Proud Passport gift package consisted of an Ohio wine guide, wine wheel, produce availability chart, farmer's market directory, cookbook featuring Ohio products, and a sampling of Ohio's specialty crop products purchased with State funds. Participating markets and wineries were asked to report sales and increased visits from this program by a survey. Those who responded to the survey reported increased sales and visits between five and ten percent. The passport program received positive feedback from the participants.

Goals & Outcomes Achieved

Lori Panda, Ohio Proud Senior Program Manager, worked with all project partners to create and maintain a successful program for Ohio's specialty crop industry.

The advertisements in the Ohio Magazine and Edible Columbus reached 388,000 consumers between the ages of 35-54 with an annual income of $100,000. This advertisement campaign educated consumers about Ohio's specialty crops and increased awareness and visits of Ohio's farmers markets and wineries. Sixteen specialty crop producers participated in Ohio Magazine's co-op advertisement program. This is slightly less than anticipated. Due to the economy, many producers had limited advertising budgets.

One hundred seventy-four (174) consumers completed and returned their passport to ODA for their Ohio Proud Passport gift package. This is a 25% increase which is more than we anticipated. This increase is attributed to the number of participating markets and wineries along with consumers' interest to support the local economy by purchasing locally grown specialty crops. We had 100 farmers' markets and wineries participate in the passport program which is more than expected. These participants received a package which included a poster, stickers, passports and produce availability poster and charts to educate consumers about the passport program. These items were displayed at the farmers markets and in the wineries.

The following promotional items were printed and distributed to educate consumers, school-age children, and produce buyers about the availability of Ohio's specialty crops. The following items were printed and distributed.

- 1,000 Produce Availability Posters were printed and distributed to 100 Ohio produce buyers encouraging them to not only purchase the products but to display the poster in their stores and 600 school food service directors who will display them in their school cafeterias. The remaining posters were distributed to small specialty stores, farm markets and wineries.
- A total of 6,000 Produce Availability Charts were printed and distributed at consumer and industry events throughout Ohio like the Farmer's Market Managers Network, local farmer's markets, Ohio Produce Growers Annual Meeting, Ohio State Fair, Farm Science Review, Easton Fall Harvest, County Fairs, Cooperative Extension offices, and at regional education seminars.

- The Ohio Farmer's Market Directory (3,000 copies) was created, printed and distributed to consumers at farmer's markets, Ohio State Fair, Farm Science Review, and County Fairs.

Beneficiaries

All of Ohio's specialty crop producers benefitted from this project specifically the Ohio wineries, farmer's markets, consumers, produce buyers, and school-food service directors. This project reached 388,000+ consumers through the magazine advertising campaign; and another 10,000 from distributing the produce available chart, posters and farmers markets directory. Farmer's Markets and Wineries who participated in the passport program reported a range of five to ten percent increase in sales. Many of the participants saw a great benefit from the passport program and would like to see this program continue in the future.

Lessons Learned

Overall the project was a success as we educated many Ohio consumers about Ohio's specialty crop industry. Ohio Proud Senior Program Manager oversaw all aspects of the project as there was a reduction in staff after the proposal was approved. This position was not filled.

The passport program was very successful as consumers returned more to ODA than anticipated. This increase can contribute to the increase of participating farmers markets as well as the popularity of markets with Ohio consumers.

This project did not meet the number of advertisers in the co-op ad program as it fell short by nine participants (15 participants instead of 24). However when a similar program was offered in 2007, there were less than 15 participants. Overall the co-op advertising program assisted those small specialty crop producers to purchase an ad for the first time. The economy put a strain on advertising budgets for our specialty crop producers.

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Project Title: **Vineyard Expansion Assistance Program**

Project Summary
The Vineyard Expansion Assistance Program (VEAP) was created in the winter/spring of 2009 as a joint project between the Ohio Grape Industries Committee (OGIC) and the Ohio Agricultural Research and Development Center (OARDC) to encourage the expansion/renovation of high-quality grape vineyards throughout Ohio. The motivation for the Vineyard Expansion Assistance Program was due to the fact that more than two-thirds of Ohio's fruit and juice used for winemaking is sourced from outside of Ohio. With one and a half to two new wineries opening per month for the past three years, Ohio doesn't have nearly enough grapes to support the winery growth in the state. More than 39 applications were submitted for review by the VEAP Working Group, with 20 applicants receiving up to $2,000 for the cost of the vines only to plant 1 acre of grapes.

Project Approach
Each recipient's site was visited pre-planting and post-planting. During the pre-planting visit the viticulture extension specialists looked at the physical site, soil analysis for the site, discussed most suitable grape varieties to grow on that site based on the all factors including past temperatures, soil, rainfall, etc. During the post-planting visit, the viticulture extension specialists made sure the vines were planted correctly including spacing of the plants, trellising systems used, proper weed management practices were in place, proper spray programs were implemented, etc.

A VEAP Working Group was created in the late summer/early fall 2009, in order to draft the program guidelines and application paperwork. This group reconvened in the fall of 2010 to review the application and guidelines.

After minor changes in the 2009 VEAP were made, applications were sent out to vineyard managers, winery owners, and other industry stakeholders via the Ohio Grape Electronic Newsletter (OGEN) and paper applications were mailed to the industry.

Completed applications were due to the Ohio Grape Industries Committee offices on October 22, 2012. More than 150 inquiries were made about the program.
All applicants were to submit a completed application, as well as have undergone a pre- and post-planting site visit from the Viticulture Extension Specialist at the OARDC.
The VEAP Working Group met in November 2010 to review and discuss the VEAP applications submitted. Twenty recipients were selected to receive funding of up to $2,000 towards the cost of vines only, to plant 1 acre of hybrid or vinifera winegrapes or table grapes. Twelve of the recipients were existing grape growers and eight were new growers to the industry.

Recipients were then notified regarding their award status. The Ohio Department of Agriculture negotiated contracts with each recipient and processed purchase orders in their name.

All recipients were then encouraged to attend various workshops pertaining to the planting and maintenance of grapes, including the 2011 Ohio Grape & Wine Conference, proper pruning techniques and herbicide volatility.

Goals & Outcomes Achieved

Although there is progress being made to complete this goal, it is probably not yet due to the Vineyard Expansion Assistance Program because it will be 3-5 years before the first harvest is received from the vines planted as a result of this program. Ohio's gallonage has increased by approximately 10,000 gallons since the program was put into place. The first real data regarding this goal should be seen in 2014-2015.

These vineyards will be visited annual by the viticulture extension specialists until a harvest is received. All recipients have been strongly encouraged and have chosen to participate in various workshops regarding successfully growing grapes, including pruning and leaf thinning topics, the annual Ohio Grape & Wine Conference which discusses a wide gamut of things such as proper herbicide and pesticide applications, leaf pulling, shoot positioning, variety selection, pests to be on the lookout for, etc.

Each VEAP recipient either currently operates a licensed winery in the state or has contracted with a licensed winery to purchase the grapes when they are ready for harvest. The goals achieved through the VEAP included the planting of more than 20 acres of high-quality, high-value grapes in Ohio. Ultimately providing Ohio wineries the ability to source more of their fruit for winemaking purposes from within the Buckeye State. This program allowed for a more stable source of high-quality grapes for Ohio wineries.
All 20 recipients completed the requirements of the program, including allowing a second-year planting site visit by the Viticulture Extension Specialist at the OARDC. Additionally, more than three-fourths of the recipients attended the 2011 Ohio Grape & Wine Conference and special workshops held in the first 6 months of 2011.

Beneficiaries

The beneficiaries of the VEAP include: Ohio wineries, farmers (able to diversify their production), farmers' markets (one producer is producing table grapes to sell at farmers'

markets), Ohio's consumers (able to purchase more locally-produced specialty crop products, including wine and table grapes.)

Lessons Learned

One lesson the Working Group learned through this process is that there is a huge interest in growing high-quality grapes in Ohio, thus the addition of "production" programs to the OGIC statute, which became law in October 2011.

Also, one recipient was unable to plant in the spring of 2011 because of the high rainfall during the spring. He requested an extension to plant in the spring of 2012 (William Dean.) This recipient did ultimately get his vineyard planted in the spring of 2012. As a result of this, we learned to be flexible and that it is better for the vines to be planted during suitable conditions rather than just planting to plant.

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Additional Information

The VEAP is a reimbursement program, therefore recipients were required to have undergone a post-planting site evaluation prior to requesting reimbursement. When requesting reimbursement each recipient provided a copy of the invoice regarding the purchase of the vines, as well as proof of payment for the vines. Once this paperwork was received, the OGIC processed the recipient's reimbursement request. Twenty recipients were reimbursed up to $2,000 for the cost of the vines, including shipping.

Project Title: Sustainable Production Skills, Market Connections and Risk Reduction for Ohio specialty crop producers

Project Summary

Cuyahoga Valley Countryside Conservancy (CVCC) and Ohio Ecological food and Farm Association (OEFFA) joined forces from 2010-2012 to provide assistance to specialty crop producers, especially those using organic and sustainable practices. Goals of the project included: (1) Beginning farmers would gain new specialty crop production skills; (2) Experienced specialty crop farmers would gain advanced production skills; (3) All would gain information on season extension including its risks and benefits; and (4) All would be provided with information on connecting with new markets. All of these educational sessions were tailored specifically for specialty crop growers, taking their unique and intensive growing needs into consideration.

In order to achieve those goals, project deliverables included: (1) a conference workshop track aimed at beginning specialty crop farmers (topics such as site selection and preparation, sustainable pest management, regulations, and diversification strategies); (2) multi-day intensive workshops on a) advanced production skills (topics such as crop planning, harvest techniques, mechanization, and labor management) and (b) season extension (practices, funding opportunities and risk management benefits); (3) technical assistance related to production, season extension, and marketing; (4) webinars on these same topics, and (5) web-based visual resource materials.

The long term goal is that these producers will expand production of specialty crops, increase net profits, and/or extend the production season, enhancing the competitiveness of Ohio's specialty crop industry and the development of the local food economy.

Project Approach

Our project approach was to provide multi-faceted educational opportunities for growers throughout Ohio. Through OEFFA's Annual Conference, pre-conference seminars, webinars, farm tours and two two-day intensive workshops. Ongoing technical assistance was also provided by both organizations to specialty crop growers seeking guidance on beginning farmer issues, advanced production & season extension topics, as well as assistance in expanding their market connections. OEFFA focused on the farm tours and annual conference, while Countryside Conservancy took the lead on the multi-day intensive series and the webinars.

Goals & Outcomes Achieved

Our goal was to reach a total of 1,975 farmers by the end of this grant cycle. We were able to reach a total of 3029.

1. Objective 1 anticipated serving 1100 farmers or would be farmers. We anticipated 25% of those participants would begin or add a specialty crop component to their current operations within 2 years of completion of this project.

   We reached 1214 farmers through workshops, tours and webinars under this objective. Of the farmers responding to surveys, 89% indicated they would add or expand their specialty crop component or begin a farm.
   Topics covered for beginning farmers include: *Effective Weed Management Strategies; Understanding Soil Biology and its role in organic crop systems; Producing organic potted herbs and other nursery crops; Growing nut trees; Growing great garlic; Making CSAs work for you; Food safety; Organic Strawberry Production; Growing Organic Sweet Corn: The Challenges and Rewards; Promoting Farm Sales Through Collaborative Marketing; Pumpkins, Squash and Bugs, Oh My!; Are You Market Ready?; Securing Credit: Plan to Succeed; Season Extension for Small-Scale Intensive Crop Production; NRCS Conservation Programs and Funding Opportunities; Companion Planting; Edible Mushroom Logs; Maple Syruping; certified organic vegetable and flower production (including walk-in cooler, raised bed machinery use); CSA and farmer market sales*

2. Objective 2 aimed to increase the production and level of efficiency for Ohio's specialty crop growers. We anticipated serving 225 operations. We expected that 50% of participants in year one offerings would adopt new techniques, equipment or practices. We also anticipated that 75% of the intensive series participants would adopt new practices learned at the series.

   666 farmers were served through programs aimed at advanced producers. 93% of those responding to surveys stated they would adopt techniques outlined to help increase production and efficiency. 100% of those responding to a survey for the

multi-day intensive series (33) stated they would adopt techniques learned either immediately or the following growing season (2012)
Topics covered for advanced producers were: *Improving Efficiency on Your Organic Farm; Increasing Product Quality; Effective Cover Cropping Strategies for Specialty Crop Growers; Growing Apples Organically; Growing Organic Celery; Using integrated pest management for insect pests in organic vegetable and fruit crops; Improving efficiency on organic vegetable farms; Maximizing crop quality; Ohio seed starting calendar, beyond the basics; Season-Long planning using spreadsheets; appropriate equipment; Seed starting and transplanting; weed management techniques and equipment; Harvest & Post harvest handling; Insect Management; Food Safety*

3. Objective 3 anticipated serving 375 farmers to help them extend the number of months their specialty crops were in production.

   554 farmers were reached on this topic, with 98% of those responding to surveys indicating they would adopt some form of season extension on their operations. We provided education on the following topics related to season extension: *Season Extension in Ohio; Season Extension options & utilizing season extension structures during the main growing season; Crop selection; Creating a plan; Ohio's Season extended; Harvest and Post-harvest handling; Disease Control; SPIN farming; Grower to Grower Experience Sharing; Berry Trellis Systems and High Tunnels; Year Round organic farm & market; Season extension for small scale intensive crop production; winter vegetable storage for year round marketing; lettuce all summer; organic production of brambles in high tunnels*

4. Finally, with Objective 4 we expected to work with 275 growers to increase the number of CSA operations, sales to chefs, institutional buyers and grocers, and increased participation in winter farmers' markets.

   462 growers were reached through our market connections workshops and webinars. Of the growers who responded to surveys, 82% stated they intended to add either a CSA operation, and/or sales to chefs or to grocers to their operations within 3-24 months.
   The following topics were covered under this objective: *Building mutually profitable relationships with chefs and restaurateurs; selling to regional grocers; year-round growers market; selling produce to restaurants and retailers; specialty crops and high tunnels; CSAs on public lands; ABCs of CSAs; Making CSAs work for you; Marketing outlets;*

Beneficiaries

The beneficiaries of our programs and workshops are specialty crop growers. Beginners are learning basic techniques, while established producers are learning new skills and strategies for increasing their production, extending their seasons and expanding their markets.

Lessons Learned

Webinars are extremely effective for farmers. We saw a tremendous response to our webinars regardless of the time of day. Additionally, the need for single-track, focused, intensive workshops is very high. The feedback we received from our intensive series was extremely positive, and farmers appreciated the amount of networking and socializing built into the series that allowed for them to discuss their challenges and solutions with one another.

Inquiries of increasing frequency from current and would-be specialty crop growers indicates those producers growing for local markets are increasingly interested in season extension opportunities as well as for diversification of the market outlets through CSAs and iterations thereof, winter farmers' markets, and growing specific items for restaurateurs and small scale grocers.

Finally, advanced producers show a high level of interest in improving their operations, both in terms of efficiency and profitability. The most positive reviews of our programs were received from the intensive series that addressed this groups needs specifically, and they showed and extremely high level of interest in other such opportunities. They were particularly excited about the fact that there was ample time to discuss challenges and solutions with fellow growers.

Contact

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Final Reports
(Approved 11/2011)

Project Title: Coordinated education and marketing project for producers

Project Summary

The 'Reach New Markets' coordinated education and marketing project helped new and existing specialty crop producers address opportunities and obstacles associated with direct marketing food products to various retail and wholesale markets. The Ohio Direct Marketing Team provided guidance for this project with leadership from the OSU South Centers.

Project Approach

a. Curriculum Development & Delivery

The Reach New Markets project included development and delivery of a 'MarketReady' curriculum, based on the work of the University of KY and OSU in 2010. As planned, education was delivered for more than 100 specialty crop producers through three workshops. Two wholesale workshops were held for 40 participants (one in Columbus, OH and one in Cleveland, OH.) A third workshop for retail and wholesale markets was held for 36 participants the evening before the Small Farm Conference in Wilmington, OH.

In addition, one webinar and two workshops were held in conjunction with new partners in southern Ohio, ACEnet (kitchen incubator) & Rural Action (Chesterhill Produce Auction). The Ohio Direct Marketing team prepared and presented four introductory presentations in conjunction with statewide conferences for the Ohio Produce Growers, OEFFA, Small Farm Conference in northern OH and the Ohio Farmser' Market Conference.

A new MarketReady section was added to the Ohio Direct Marketing Team's website - http://directmarketing.osu.edu/content/marketready.htm. Online content, including a brief presentation and video clips, were added the website. According to Google Analytics, more than 100 unique users visited this section of the website.

b. Project Management and Communications:
At the beginning of the project, a working group met to plan the project. At the end of the project, the group met to review lessons learned, prioritize curriculum updates, draft a new online evaluation process for ongoing client follow-up, and plan for future program enhancements and instructional resources that can be shared by instructors.
The project leader communicated the program to statewide audiences through various media and event displays, such as the events listed above and the Ohio Farm to School Conference which attracted 300 people.

<u>Goals & Outcomes Achieved</u>
Quantitative and qualitative evaluation was incorporated into the project to gather information related to the following goals.

1. *Improve specialty crop producer readiness to reach new retail and wholesale markets through coordinated education*
More than 100 producers participated in the workshops, with more than 95% reporting improvement in knowledge and ability to reach new markets in a post-workshop written evaluation. In a follow-up survey, 80 participants reported improving their marketing practices to reach new markets.

2. *Increase connections between producers and buyers through coordinated marketing*
At least 60 specialty crop producers used Ohio MarketMaker to reach new markets, according to Ohio MarketMaker reports.

3. *Make economic development project relevant and sustainable*

Additional follow-up surveys with producers will happen this winter to better understand improvements in market access and the long term economic impacts. Based on feedback from participants, we are making improvements in the program agenda (more time), materials (more dynamic) and evaluation process (simple, online and in sync with evaluation on other programs).

Beneficiaries

Beneficiaries were Ohio specialty crop producers interested in reaching new markets. Education was delivered throughout the state to serve the diverse group of specialty crop producers serving Ohio's lakefront counties, Amish and Mennonite communities, urban neighborhoods and Appalachian areas. Participants sold fresh, as well as value-added specialty crop products. Some had years of experience, while others were new to production and marketing.

Lessons Learned

Requests for this program and delivery of the education exceeded our expectations and required more time and resources than originally anticipated. We addressed this challenge by attracting new partners and attracting additional funding.

The project was not initiated until January, 2011, which left six months for the project. Therefore, the focus was on development, promotion, delivery and initial evaluation of the program. As this program is integrated into the work of the Ohio Direct Marketing Team, online participant follow-up surveys will gather information on the long term economic impacts, including the percentage of increase in connections with buyers, growth in access to new markets and improved profitability.

Contact Person

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Additional Information

The MarketReady program continues to expand. The Ohio Direct Marketing Team will continue to develop and evaluate the program using other funding.

Case studies, video clips and other dynamic content is being added to the presentations. The team held a meeting at the OSU eLearning Center and the online learning center in the College of Food, Agriculture and Environmental Sciences to review various tools, such as Adobe Connect for Webinars; Carmen and Moodle for course development; and Udutu for online tutorials. Survey Gold software will be used for ongoing evaluations.

The focus will remain on improving the sustainability and profitability of Ohio fruit and vegetable producers by helping them address the opportunities and obstacles associated with various retail and wholesale markets.

Project Title: Create an "Ohio Local Food Finder" Website for Mobile Devices

Project Summary

For the Local Food Finder specialty crop coordinated marketing project, a new user-friendly mobile website was developed to increase consumer access to Ohio specialty crops and their producers.

Mobile device users can use this to locate specialty crop producers through simple searches that lead to farm and farmers' market contact information, locations, products and maps (see page 4). This project focused on the initial phase of development. Based on the foundation and feedback from this project, future phases will add more consumer-driven features. During the scope of this project, the mobile website was launched to a test group and then will be marketed to a wider consumer audience.

Project Approach

Primary activities included data management, technology management, project management and communications. The impetus for the project was to address the mobile media marketing opportunity.

Most Americans can't imagine leaving home without their mobile phone, whether it be an iPhone, Android, Blackberry or Windows Mobile phone. Nearly all adults in the U.S. now have cellphones, with one in four having smartphones (The State of Mobile Apps, Nielsen, 2010). Mobile applications (apps) are accessed through smartphones, as well as iPads, tablets and other mobile devices. Nielsen reported that the most popular categories of app downloads include games, weather, maps/navigation and social networking. One in five smartphone users currently use location-based "check-in" services on their phones, such as Facebook Places, Foursquare and Gowalla, representing 16.7 million U.S. mobile subscribers (comScore, May, 2011). Businesses can interact with consumers who use these geosocial apps through special offers, deals and other incentives.

a. Data Management:

To make the most of this project investment and develop a sustainable resource, MarketMaker data was used as the primary data source. Specialty crop producers who added their profile to the web-based MarketMaker program are included in the mobile version. Negotiations with state and national partners resulted in favorable project participation. MarketMaker is a web-based resource, currently used in 20 states including Ohio that

connects people in the food industry. For this project, the focus was on connecting consumers with specialty crop food. As the mobile app develops, producers will be encouraged to get involved with related social media marketing opportunities.

b. Technology Management:
The OSU specialty crop project team leader worked with the MarketMaker network, the University of Illinois Super Computer Center and a programmer from Penn State Extension/Pennsylvania MarketMaker. The University of Illinois provided an Application Programming Interface (API) to securely access specialty crop producer data. This is a particular set of rules ('code') and specifications that software programs follow to communicate with each other. The programmer at Penn State used these protocols and tools to create an interface. Together, this team worked through the logistics of creating, evaluating and refining the mobile website for an initial launch that could be used by consumers in Ohio, as well as in the other MarketMaker states.

During development, the mobile website was evaluated on ease and efficiency of interaction because the developers recognized that that there are at least 5,200 handsets in the world today (6/2011), with tiny screens and tiny 'input keys', as well as numerous browsers and various operating systems (Windows, iPhone, Android, Blackberry).

Consumers can search by type of product, type of business (such as farmer or farmers' market) and by business name. Results show a map and listing with active links to phone, location and specialty crop producer website.

c. Project Management & Communications:
Meetings with local, state and national partners were held to discuss the scope of the project, the name of the mobile website, features for this initial version, options for future developments, project promotions, data improvements, technology considerations and project management. National partners provided technology resources. State and local partners provided specialty crop producer data, consumer testing and project outreach. The OSU specialty crop project team leader worked with a graphic designer to prepare promotional materials.

Goals & Outcomes Achieved
The new mobile website improves marketability of specialty crops by increasing accessibility to local foods. As the proportion of consumers using smart phones to find local food continues to grow exponentially, this program positions the Ohio specialty crop food industry to create a collaborative mobile friendly web presence and will allow Ohio specialty crop producers to capture a greater share of the consumer food dollar. The long term goal of the project is to increase the consumption by consumers of Ohio-produced specialty crops. The convergence of the increasing interest in access to locally produced foods and the increasing number of consumers who rely on mobile devices as a reliable source for accurate information creates a tremendous opportunity for Ohio specialty crop producers. As these two trends continue to rise, Ohio specialty crop producers are positioned to keep up with trends.

Beneficiaries
Beneficiaries were specialty crop producers interested in reaching mobile customers. Data from the 500 producers who entered profile information into the Ohio MarketMaker program benefit from the new mobile web application.

Lessons Learned
The project was not initiated until late December, 2010, which left six months for the project. Therefore, the focus was on development of the data, technology, partner support and preparation for promotions. The official project announcement to consumers, as well as evaluation of the number of users, data on usage and impact measures and will be conducted by the two groups designated for post-project activity and ongoing project improvements -- Ohio Direct Marketing Team & Ohio MarketMaker Working Group.

Initially, the team explored calling the website Buckeye Food Finder. However, in order to maximize partner support and best serve specialty crop producers in all areas of the state, including those closely bordering other states, a multistate program approach was pursued. The name of the mobile website was changed to Food Searcher. In Ohio, it is promoted as Ohio Food Searcher.

Contact Person
Julie M. Fox, Ph.D., fox.264@osu.edu

Additional Information
The investment helped launch this project and the team is continuing to enhance the navigation, social media components and data quality/quantity. The team will continue development, based on user tests and input from other MarketMaker states interested in sharing the technology. The project leader will meet with project partners and the Ohio Produce Growers & Marketers Association (OPGMA) to advance program promotions. According to Google Analytics, OPGMA is the leading source of MarketMaker visitors. In addition, the Ohio Direct Marketing Team teaches educational programs for specialty crop producers to learn about social and mobile media marketing. Evaluation will include:

Consumers
- How did they find out about Ohio Food Searcher?
- How would they rate the ease of use?
- How would they rate the value of the information?
- What would they tell friends about Ohio Food Searcher?
- How would they suggest the site be improved?

Specialty Crop Producers
- How did they find out about Ohio Food Searcher?
- How do they rate the value of the mobile website on improving marketability of specialty crops?
- What would they tell colleagues about Ohio Food Searcher?
- How would they suggest the site be improved?

Based on these responses, site upgrades can be made and training will be conducted this winter to help Ohio specialty crop producers take full advantage of this technology to communicate with consumers and ultimately capture greater market share. This helps increase the financial stability of Ohio specialty crop producers.

This first phase of the web application includes simple searches by various business types and by business names. Future developments will include unique food experience indictors and social mobile media features. When people view Ohio MarketMaker on a mobile device, they will be directed to this site. When visitors view Food Searcher (powered by MarketMaker), they will go directly to this mobile website.

Honey Bees

They need us – We need them

- In past years, honey bee populations have been in steep decline.
- Bees provide the critical pollination services that can sustain Ohio's agricultural future.
- Nearly all fruit and many vegetables require insect pollination.
- Ohio's beekeepers are more important than ever.
- Continued education is critical for beekeepers – at all skill levels.

The Ohio State Beekeepers Association serves Ohio Beekeepers by providing a community that facilitates learning, networking, and connecting to allied institutions and organizations that have an interest in beekeeping.

Help Sustain Ohio's Pollinators

Ohio State Beekeepers Association

Terry Lieberman Smith
PO Box 24181
Dayton, OH 45424

ohiostatebeekeepers.org

Beekeeper Training

Increase Your Knowledge and Skills

Ohio State Beekeepers Association

ohiostatebeekeepers.org

Promoting Better Beekeeping

The Ohio State Beekeepers Association is committed to the expansion of beekeeping as an avocation or business opportunity for interested individuals. The OSBA is proud to introduce this comprehensive online video training program for both novice and experienced beekeepers.

Program Goals

This program is funded by a USDA/ODA Specialty Crop Block Grant. Our goals include:

Maintaining and expanding online instructional materials for beekeepers.

Encouraging more people to pursue beekeeping as an avocation or business.

Promoting and sharing best practices with the beekeeping community.

Active participation in learning, networking, and connecting people to allied organizations and institutions.

"Learning the skills has never been easier"

The online series is comprised of 34 detailed training videos that address practical aspects of elementary beekeeping. The video clips are short, 3-9 minutes in length, but provide concise information on the subject matter. The videos may be used chronologically or independently.

Video Topics Include:

- Biology
- Hive Equipment
- General Management
- Package Bee Installation
- Queen Management

Additionally, slide presentations are provided as supplementary learning tools.

ohiostatebeekeepers.org

Meet Your Hosts

The online videos are hosted by two seasoned beekeepers:

Dr. Jim Tew, who served for more than 35 years as the State Specialist for The Ohio State University and is presently the State Extension beekeeping Specialist for Auburn University.

John Grafton, a life-long beekeeper who served as the Ohio Department of Agriculture State Apiarist for 34 years.

OPGMA Ohio Produce Growers & Marketers Association

The development of this program was supported by the Ohio Produce Growers & Marketers Association. opgma.org

DON MYERS EASTERN OHIO APICULTURE PROJECT: SURVEY REPORT

J. G. FERRELL

Abstract. The Don Myers Eastern Ohio Apiculture Project (DM) was conducted by the Ohio State Beekeepers' Association in 2008 with funding and support provided by numerous organizations. The DM was intended to introduce the practice of beekeeping to an impoverished region as a means toward economic stimulus and to increase public interest and participation in beekeeping. A total of 111 non-beekeepers were provided training, equipment, and honey bees at no cost to the participants. The equipment and honey bees allowed the maintenance of two hives. The training course was designed to teach introductory concepts and practices, and participants agreed to attend meetings of local beekeeping organizations to continue their education.

Two years after the completion of the DM, a survey was mailed to each former participant. The survey attempted to gauge participants' evaluation of the DM and determine whether the program had met its goals. This brief report begins with an overview and analysis of the data resulting from the 2010 survey. Interpretation of the data is limited by initial design factors, but basic aggregation reveals that the DM is favorably-recalled by nearly all participants and that a majority of participants are still active beekeepers.

1. Methods

1.1. **Survey.** In 2010 a survey was mailed to each DM participant. Along with developing an evaluation of the DM itself, the goals of the survey were to determine the proportion of participants still keeping bees, compile factors important to the success or failure of novice beekeepers, and identify resources necessary to retain active beekepers. After they were completed and returned by participants, the contents of surveys were entered into a mySQL 5.1.41 database, and a script combining PHP 5.3.2 and R 2.10.1 was written to conduct analyses for this report.

Of the 111 surveys sent, 69.37% have been returned and entered into the database as of March 23, 2011. Each survey contained 24 questions

Date: March 23, 2011.

(see Appendix A), of which 17 were multiple choice. Of the remaining 7 questions, 5 requested a quantitative answer from participants, and the remaining 2 were provided to participants as free response. For the sake of analysis, free response questions were coded into 9 arbitrarily-chosen categories (see Appendix C) as surveys were entered into the database.

1.2. **Notation.** This report conducts an analysis encompassing four levels of data. That is, operations can be performed on the overall survey, individual questionnaires, individual questions, or individual answers. These levels are not mutually exclusive, and invoking multiple levels during an operation can produce informative results. As such, a brief discussion of these levels and the development of standard notation are necessary for clarity of writing.

1.2.1. *Indices.* The survey DM is a set of questionnaires Q_i, which are sets of questions q_{ij} with sets of answers $a_{i,j,k}$.[1] In other words, the indices i, j, and k reference any given questionnaire, question, and answer respectively. When an index is defined as a certain number, it references that datum specifically. For example, Q_4 references the questionnaire with control number 4 to the exclusion of all others. Similiarly, $a_{6,10,0}$ references the first possible answer ($k = 0$) to the tenth question ($j = 10$) on the sixth questionnaire ($i = 6$). Note that the count of possible answers begins at 0, while those of surveys and questions begin at 1.

Although referencing a single possible answer to a single question on a single survey is unimportant to this analysis, the notation permits clear discussion of relevant concepts. For example, $a_{i,10,1}$ references the first possible answer to question 10 on any given survey, and $a_{i,10,k}$ references any possible answer to question 10 on any given survey. If an index is not present in a variable reference, that level of the analysis is not under consideration. For example, a_j refers to all possible answers to q_j, whereas $a_{i,j}$ refers to all possible answers to q_j on any single survey Q_i, and a_k refers to all possible answers. This distinction can be crucial to understanding the notation for and application of analytical operations (overviewed in in the remainder of this section).

[1] In set theory, the symbol "$\subseteq$" describes the relationship between two sets which are composed of identical elements, and the symbol "$\subset$" describes the relationship between two sets where the second set contains, amongst other elements not included in the first, all elements of the first. So, using set notation, the relationship among levels of analysis could be described as $a_{ij} \subseteq q_{ij}$, $a_i \subseteq q_i \subseteq Q_i$, and $a_{ijk} \subset q_{ij} \subset Q_i \subset DM$.

Note: The order of answers to binomial truth-value questions (i.e., those which can be answered with either "yes" or "no") may have been changed to simplifiy programming and conform with convention. Regardless of their order on the actual survey, they have been entered into the database so that the possible answer "no" $= a_{i,j,0}$ and the possible answer "yes" $= a_{i,j,1}$. This will be apparent in the report's analytical tables, but should be kept in mind if one consults the original surveys.

1.2.2. *Basic operations.* A basic counting operation underlies much of this report. $N(X)$ refers to the total number of X, whereas $n(X)$ refers to the number of X in some restricted scope. Typically, $N(X)$ will equal the the total number of X in the set DM, and $n(X)$ will refer to the number of X returned and entered into the database. So $N(Q) = 111$ and $n(Q) = 77$. Although n and N usually refer to sample size and population size respectively, this is similar but *not* necessarily equivalent to their use in this report.[2] Reading $N(X)$ as "the number of X sent to participants" and $n(X)$ as "the number of X entered in the database" should not lead one far astray.

Due to the design of the survey, the modal response to q_j is often the only applicable measure of central tendency. The mode of X is represented by mode(X) and is defined as the most common element in set X. So $a_{i,j,k=x}$ is a modal response to q_j if and only if $n(a_{i,j,k=x}) \geq n(a_{i,j,k\neq x})$. Modal responses to each non-quantitative question can be found in Appendix B without requiring special analysis.

However, when it is possible to do so (i.e., when a_j is numeric), the mean and standard deviation are also provided as measures of central tendency and dispersion. The standard deviation of responses to question j is represented by $s(q_j)$ and computed as

$$s(q_j) = \sqrt{\frac{1}{n(q_j) - 1} \sum_{m=1}^{n(q_j)} \left(n(q_j)_m - \bar{q_j} \right)^2}.$$

[2]Rather than indicating sample size, $n(X)$ is more appropriately a subset of X where each element X_i has been entered into the database. A symbol in the form $n(X)$ usually is short-hand for the cardinality of that set (the number of elements in a set – more appropriately written $|n(X)|$), but alternative uses, such as in the computation of standard deviation, are uncommon. Therefore, $n(X) \equiv |n(X)|$ usually. When it is necessary to reference elements in the set $n(X)$, the notation $n(X)_m$ will be used.

The symbol $\bar{q_j}$ is the mean response value for q_j, which is computed as

$$\bar{q_j} = \frac{1}{n(q_j)} \sum_{m=1}^{n(q_j)} n(q_j)_m,$$

and $n(q_j)_m$ refers to any given member of $n(q_j)$. In other words, m is an arbitrary index used here for the sake of computationally cycling through responses to q_j that are in the database.

1.2.3. *Proportions.* Finally, using basic operations outlined in Section 1.2.2, a number of proportions can be calculated. For example, the overall response rate is calculated $\frac{n(Q)}{N(Q)} = \frac{77}{111} = 0.6937$. As another example, the proportion of participants who consider beekeeping an individual project to those who consider it a family project is

$$\frac{n(\text{“Individual”})}{n(\text{“Family”})} = \frac{n(a_{11,0})}{n(a_{11,1})} = \frac{29\ \mathrm{a}_{11,0}}{37\ \mathrm{a}_{11,1}} = 0.7838\ \frac{\mathrm{a}_{11,0}}{\mathrm{a}_{11,1}}.$$

The value of a proportion within the population can be inferred from a sample proportion within a certain margin of error. Since the population of DM participants is small, and the return rate of surveys is high, a "finite population correction" is factored into the calculation of the margin of error. Therefore, proportions in this report will be calculated using

1.3. **Pearson's chi-square test.** Observed frequencies can be compared to expected frequencies using Pearson's chi-square (χ^2) test. With question 11 ($j = 11$) serving as an example again, the total number of observed responses $O_{j,k}$ to q_j where $k = 0$ (“Individual”) is

$$O_{j,k} = n(a_{j,k}) = 29,$$

whereas the expected number $E_{j,k}$ of $a_{j,k}$ can be calculated with

$$E_{j,k} = \frac{n(q_j)}{N(a_{i,j})} = \frac{71}{3} = 23.7.$$

In other words, for any given questionnaire Q_i, $q_{i,j}$ has $N(a_{i,j})$ possible answers. If each participant who responds to q_j selects 1 possible answer $a_{i,j,k}$ at random, the resulting frequency of each $a_{i,j,k}$ will be equal to the quotient of $n(q_j)/N(a_{i,j})$.

To determine whether observed frequencies $O_{j,k}$ differ significantly from expected frequencies $E_{j,k}$ the test statistic X_j^2 is calculated as

$$X_j^2 = \sum_{k=0}^{N(a_{i,j})-1} \frac{(O_{j,k} - E_{j,k})^2}{E_{j,k}}$$

and then compared with the χ^2 distribution using $N(a_{i,j}) - 1$ degrees of freedom (df) to determine the probability of randomly obtaining the value of X_j^2.

Traditionally in statistical hypothesis testing, if the probability of the test statistic is less than 5%, then the null hypothesis (H_0) is rejected. If, for example, the distribution of frequencies among a_j where $j = 11$ were interesting for some reason, the null hypothesis could be $H_0 : n(a_{j,0}) = n(a_{j,1}) = n(a_{j,2})$. The alternative hypothesis (H_1) could be that not all frequencies of $a_{j,k}$ are the same. Using the above calculation, $X_j^2 = 23.4$. The probability of obtaining this value of X_j^2 by chance is much less than 5% ($p = 8.3 \times 10^{-6}$), therefore H_0 would be rejected. This approach is subject to debate, and is discouraged by advocates of Bayesian statistics, but the p value itself (i.e., when not compared against a set α level) is still a useful metric. As such, this report presents the approximate p value of each X^2 rather than relying solely on measurement against critical values at $\alpha = 0.05$.

Caveat lector. Although this report uses the X^2 test statistic, the applicability and the reliability of the test is *not* guaranteed. Rather, inferences should be judged in combination with other information provided by the report. For example, one confounding factor inherent to the survey design is that possible responses are not mutually exclusive. Regarding multiple choice questions, participants commonly selected more than one possible answer. This is the case when – but not necessarily *only* when – $n(q_j) \neq n(a_j)$. Exclusivity of possible responses suffers even further in the free response scenario of questions 22 and 24. A second confounding factor is that an intentional sample was not randomly selected from the population of DM participants. Therefore, any statistical inferences based on the data *may* be unreliable. Using a Monte Carlo technique, the DM data could be resampled and tested against a control group, although such an analysis may involve more effort than it is worth (see Section 3).

2. Results

Lorem ipsum.

3. Discussion

Lorem ipsum.

Appendices

A. Survey questions

$q_{j=}$	Text
1	Are you still keeping bees?
2	If you are not still keeping bees, why did you quit?
3	Do you plan to keep bees again?
4	How many colonies do you presently own?
5	From the original two colonies that you received from the project, how many were alive in the fall of 2009?
6	Did you acquire, any other colonies in 2009, if so how many?
7	How many colonies were alive in the fall of 2009?
8	How many colonies were alive in spring of 2010?
9	Did you replace any overwinter die outs? If so, what method did you use to replace die outs?
10	Have any of your colonies produced?
11	For you, beekeeping is a _?_ project:
12	Has your beekeeping influenced anyone else
13	Do you feel the requirement to attend meetings is beneficial?
14	Are you a member of any bee groups or associations?
15	Have you attended meetings?
16	Have the meetings been helpful?
17	Have you had any contact with any class instructors?
18	What parts of the classes were effective?
19	What parts were not effective?
20	Where else do you get information?
21	Do you now subscribe to a beekeeping magazine, newsletter etc.?
22	What was the most important thing to be successful?
23	Do you feel the Don Myers project was worthwhile?
24	Comments ...

B. Possible answers

$q_{j=}$	$a_{j,k=}$	$n(a_{j,k})$	Text
1	0	6	No
	1	65	Yes
2	0	6	Bees died couldn't replace
	1	0	Lost interest
	2	0	Too hard
	3	0	Other
3	0	1	No
	1	14	Yes
9	0	15	No
	1	49	Yes
10	0	15	None reported
	1	35	Surplus honey
	2	9	Pollen
	3	1	Wax
	4	1	Other
11	0	29	Individual
	1	37	Family
	2	5	Other
12	0	24	To become a beekeeper
	1	58	Generate interest in bees/beekeeping
13	0	4	No
	1	62	Yes
14	0	33	Ohio State Beekeepers Association
	1	0	Eastern Apiculture Society
	2	0	Heartland Apiculture Society
	3	60	Local group
15	0	34	Regularly
	1	35	Occassionally
	2	1	Never
16	0	4	No
	1	64	Yes
17	0	20	No
	1	48	Yes

Continued on next page...

B. Possible answers (*continued*)

$q_{j=}$	$a_{j,k=}$	$n(a_{j,k})$	Text
18	0	59	Audio visual
	1	61	Hands on
	2	65	Instructors question and answer session
19	0	4	Audio visual
	1	2	Hands on
	2	1	Instructors question and answer session
20	0	39	Newsletters
	1	43	Websites
	2	62	Magazines
	3	54	Personal communication
21	0	21	No
	1	50	Yes
22	0	26	networking
	1	12	healthy bees
	2	11	education
	3	0	more
	4	17	experience
	5	0	gratitude
	6	13	perseverance
	7	0	improvement
	8	2	other
23	0	0	No
	1	71	Yes
24	0	5	networking
	1	0	healthy bees
	2	0	education
	3	8	more
	4	2	experience
	5	17	gratitude
	6	0	perseverance

C. Free response categories

Code	Description
0	Networking: attending meetings, talking with other beekeepers, consulting mentors, etc.
1	Healthy bees: inspecting hives, overwintering, controlling disease, etc.
2	Education: reading, taking classes, etc.
3	More: requests for future programs like DM.
4	Experience: Hands-on pratice, etc.
5	Gratitude: expressions of gratitude.
6	Perseverance: not giving up, etc.
7	Improvement: suggestions for future courses.
8	Other: responses that do not fit elsewhere.

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DON MYERS EASTERN OHIO APICULTURE PROJECT: SURVEY REPORT

(PROJECT UPDATE)

J. G. FERRELL

1. Project update

This document serves as a brief update to inform concerned parties of the current state of the Don Myers Eastern Ohio Apiculture Project (DM) survey analysis and report. The DM survey project is an attempt to assess the success of the DM by analyzing a survey mailed to participants two years after completion of the program. Returned surveys are entered into a MySQL (*v.* 5.1.41-3ubuntu12.8) database, and a PHP (*v.* 5.3.2-1ubuntu4.5) script has been developed to calculate descriptive and inferential analyses of and dynamically deliver survey data. While the script is sufficiently functional to provide preliminary results, a number of statistical methods still need to be researched and possibly implemented. Furthermore, although PHP and MySQL were chosen for the initial analysis due to (i) the fact that surveys are still being returned and (ii) the LAMP software development environment being particularly efficient at handling dynamic data, final testing (i.e., when dynamic database integration is no longer required) will be conducted with specialized statistical software such as R or SAS if it becomes prudent to do so. Such a transition will be trivial.

Because the final report is intended to be useful to a general audience, it is crucial that a clear explication of its quantitative methods is provided. Therefore, the final report contains adequately nuanced discussion of statistical interpretation, inherent limitations of inferential results, and the utilized mathematical notation. Although subject to revision and expansion, most of this explication has been completed. In the interest of brevity and time management, and since this update neither contains inferential statistics nor relies upon arcane notation, values are herein presented without detailed discussion. However, anyone concerned with such matters is encouraged to contact the author directly via e-mail rather than citing this document.

Date: January 10, 2011.

2. Preliminary results

Of the 111 surveys sent to DM participants, 77 (69.37%) have been returned and entered into the database. Because methodological research and software development have been given priority over data entry during the past few weeks, an estimated 10 surveys have been returned but not yet entered into the database. However, data entry is a relatively trivial task, and the project's analytical software is fully database-driven.

The main question that the final report attempts to address is: Did the DM achieve its goals? These would appear to be three-fold. First and most directly, the DM sought to recruit new beekeepers. As such, the percentage of DM participants still keeping bees is of interest. Second, the program sought to increase public awareness of and interest in honey bees and beekeeping. Common sense leads one to expect overlap between effects of this goal and the first. The final report will attempt to analyze this in some detail. Finally, the program attempted to introduce the practice or increase the prevalence the practice of beekeeping into impoverished regions of Ohio as a means toward economic stimulation.

2.1. **Recruiting new beekeepers.** Calculation of confidence intervals for percentage measures is not yet available, but its implementation is imminent. That being said, 84.4% of all respondents ($n = 65$), or 91.5% of those who responded to the pertinent question, report that they remain active beekeepers. Of the 15 participants that responded to whether or not they planned to start keeping bees again, 14 responded affirmatively. However, only 6 participants responded that they were not currently keeping bees, so these results are ambiguous without further analysis.

Although difficult to determine, it seems that all or nearly all respondents who are not currently keeping bees suffered colony losses at some point between the conclusion of the DM and reception of the survey. This is not to say that current beekeepers suffered fewer losses than non-current beekeepers – such a statement would require further analytical support. Unfortunately, the survey questions pertaining to colony losses were evidently confusing. Furthermore, the fact that nearly all respondents are current beekeepers (with either living colonies or the expressed intention of purchasing bees in the near future) makes analyzing factors affecting the drop-out rate of novice beekeepers impossible. Regardless, since the survey authors are apparently concered with this possibility, the final report attempts to provide insight where it is not precluded by analytical parameters.

2.2. **Raising awareness and interest.** As previously mentioned, this goal probably overlaps with the first. The final report provides a more elaborate discussion of this topic, but 82 responses indicate that participants have influenced at least one other person to become a beekeeeper ($n = 24$) or generated interested in bees or beekeepering ($n = 58$). Responses are *not* mutually exclusive, and other questions pertain more tangentially to both this goal and the first, so these numbers should be accepted only in a tentative fashion.

2.3. **Economic stimulation.** The success of the DM in relation to this goal has been the most difficult to assess. First, the details of this goal are unknown to the current author. Presumably, the goal was to have the practice of beekeeping result in monetary gain for the novice beekeeper. Details can be clarified, but the second problem is less tractable: only one question on the survey attempts to directly measure *possible* economic gain, and the data suffer from ambiguity due to confused response. Furthermore, no questions result in data on *actual* economic gain. With regards to this goal, simple counting – such as has been provided above – will not suffice. It is not impossible to obtain some kind of conclusion, but whether or not it would be worth the additional research or surveying should be discussed in committee.

3. Problems encountered

Most of the analytical problems have been due to (i) confused response and (ii) the absence of an adequate control group. Confused response is most evident in the quantitative questions. Anecdotally, respondents sometimes answer with sequences of colony survival or extinction that are logically impossible. However, something like "confounding response" is more common with the multiple choice questions. Respondents would often choose more than one answer. Although, the survey seems to have been designed with this as an intended possibility, it did not clearly state that multiple responses were acceptable to a single question. Therefore, results are ambiguous.

Regarding the second problem, in 2010 – shortly after the DM survey was sent to DM participants – a nearly identical survey was sent to novice beekeepers who did not participate in the DM. However, it is unknown to the current author whether the recipients of the control survey were novice beekeepers in 2008, 2009, or 2010. In other words, the DM group consisted of subjects naïve until 2008, the control group may have consisted of subjects naïve until 2010, and both groups were surveyed in 2010. A two-year duration of career is a potentially confounding factor. Unless the control group consists of beekeepers who

were novice in 2008, its integration into the analysis may lead to faulty conclusions.

4. Concluding statements

Despite the analytical problems discussed above, the DM seems to have been a success to the extent that a large majority of its participants remain beekeepers. Furthermore, its participants have helped to foster a larger interest in bees and beekeeping. In the free response question #24 ("Comments..."), over 40% of surveys entered into the database thank the program organizers for the opportunities provided by the DM ($n = 17$), directly recommend future programs like the DM ($n = 8$), or offer suggestions for future programs ($n = 7$). Although its economic impact is still speculative, and authoritative numbers are reserved for the final report, anything but a positive evaluation of the DM seems unlikely.

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Don Myers Eastern Ohio Apiculture Project Survey

County: _____ Instructor: _____

Name: (optional) _____

1. Are you still keeping bees? *(IF **NO, please answer questions 2 & 3**; IF **YES**, **please answer questions 4 to 17)*** Yes _____ No _____

2. If you are not still keeping bees, why did you quit? (circle all that apply)
    a. Bees died couldn't replace
    b. Lost interest
    c. Too hard
    d. Other _____

3. Do you plan to keep bees again? Yes _____ No_____

----------Still have bees? Please answer questions below----------

4. How many colonies do you presently own? _____

5. From the original two colonies that you received from the project, how many were alive in the fall of 2009? _____

6. Did you acquire any other colonies in 2009, if so how many? _____

7. How many colonies were alive in the fall of 2009? _____

8. How many colonies were alive in spring of 2010? _____

9. Did you replace any overwinter "die outs"? If so, what method did you use to replace, die outs? _____
_____

10. Have any of your colonies produced?
    a. Surplus honey, if so how many pounds? _____
    b. Pollen
    c. Wax
    d. Other _____

11. For you, is beekeeping a _?_ project:
    a. Individual
    b. Family
    c. Other _____

12. Has your beekeeping influenced anyone else
    a. To become a beekeeper
    b. Generate interest in bees/beekeeping

13. Do you feel the requirements to attend meetings is beneficial? _____
_____

CONTINUED ON BACK

14. Are you a member of any bee groups or associations?
    a. Ohio State Beekeepers Association
    b. Eastern Apiculture Society
    c. Heartland Apiculture Society
    d. Local group; if so, name of group(s) _____

15. Have you attended meetings?
    a. Regularly
    b. Occasionally
    c. Never

16. Have the meetings been helpful?
    a. Yes
    b. No

17. Have you had any contact with any class instructors?
    a. Yes
    b. No

18. What parts of the classes *were effective*?
    a. Audio visual
    b. Hands on
    c. Instructors question and answer session

19. What parts were *not effective?*
    a. Audio visual
    b. Hands on
    c. Instructors question and answer session

20. Where else do you get information?
    a. Newsletters
    b. Websites
    c. Magazines
    d. Personal communication

21. Do you now subscribe to a beekeeping magazine, newsletter etc.?

    a. Yes ---- If so which._____
    b. No

22. What was the most important thing to be successful? _____
    _____

23. Do you feel the Don Myers project was worthwhile?
    a. yes
    b. no

24. Comments …

News Release

Center for Innovative Food Technology

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FOR IMMEDIATE RELEASE
Wed., Mar. 30, 2011

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Vertical growing, hoop houses move up in awareness

TOLEDO, OH – As the nation continues to adjust in today's tough economic climate, many people continue to seek additional ways to save money. A new method of growing produce gives almost anyone the opportunity to raise their own fresh tomatoes, lettuce, strawberries, and more. Called a high-density vertical hydroponic growing system, this enables plants to be grown without soil in nearly any location, big or small – from parking lots to small apartment patios.

Quite simply, vertical growing systems have taken plant production to new heights using a fraction of the space. As a rule of thumb, what traditionally requires eight acres of land can be produced in just one acre when growing vertically.

Rebecca Singer, vice president and director of agricultural programs, Center for Innovative Food Technology (CIFT), will present information on this innovative growing method as well as the use of hoop houses, during a free information session Thurs., Apr. 7 from 2 – 3:30 p.m. at the Economic and Community Development Institute (ECDI) Training Center, 1655 Old Leonard Ave., Columbus, OH 43219, where material basics, cost, and details on these systems will be discussed.

A hoop house or "high tunnel" has successfully expanded the growing season for nearly year-long production with no heat applied as well as minimal cost/labor. Together, hoop houses and vertical hydroponic growing systems assist in increasing economic and social impacts relating to food and agriculture. The demand and desire for local food is an unmatched trend within the industry of which the time is right for Ohio agricultural advancements.

Numerous groups, organizations, and individuals across northwest Ohio have implemented these systems successfully and increased the amount of fresh produce available to urban settings significantly.

Best of all, guests can attend this session free, which is sponsored by CIFT, ECDI and Ohio Department of Agriculture's Specialty Crop Program. Register by visiting, http://ecdi.org/programs/Training/training_calendar.html. For additional information, contact Bob Leighty, training coordinator, ECDI, at 614-732-0574 or rleighty@ecdi.org.

About the Center for Innovative Food Technology

The Center for Innovative Food Technology is a developer and provider of technical innovations and solutions for the food processing, agribusiness and agricultural sectors of the economy in our region, our state and beyond. These innovations and solutions are developed in order to enhance the economic performance of the food processing and agricultural sectors. More information is available at ***www.ciftinnovation.org****.*

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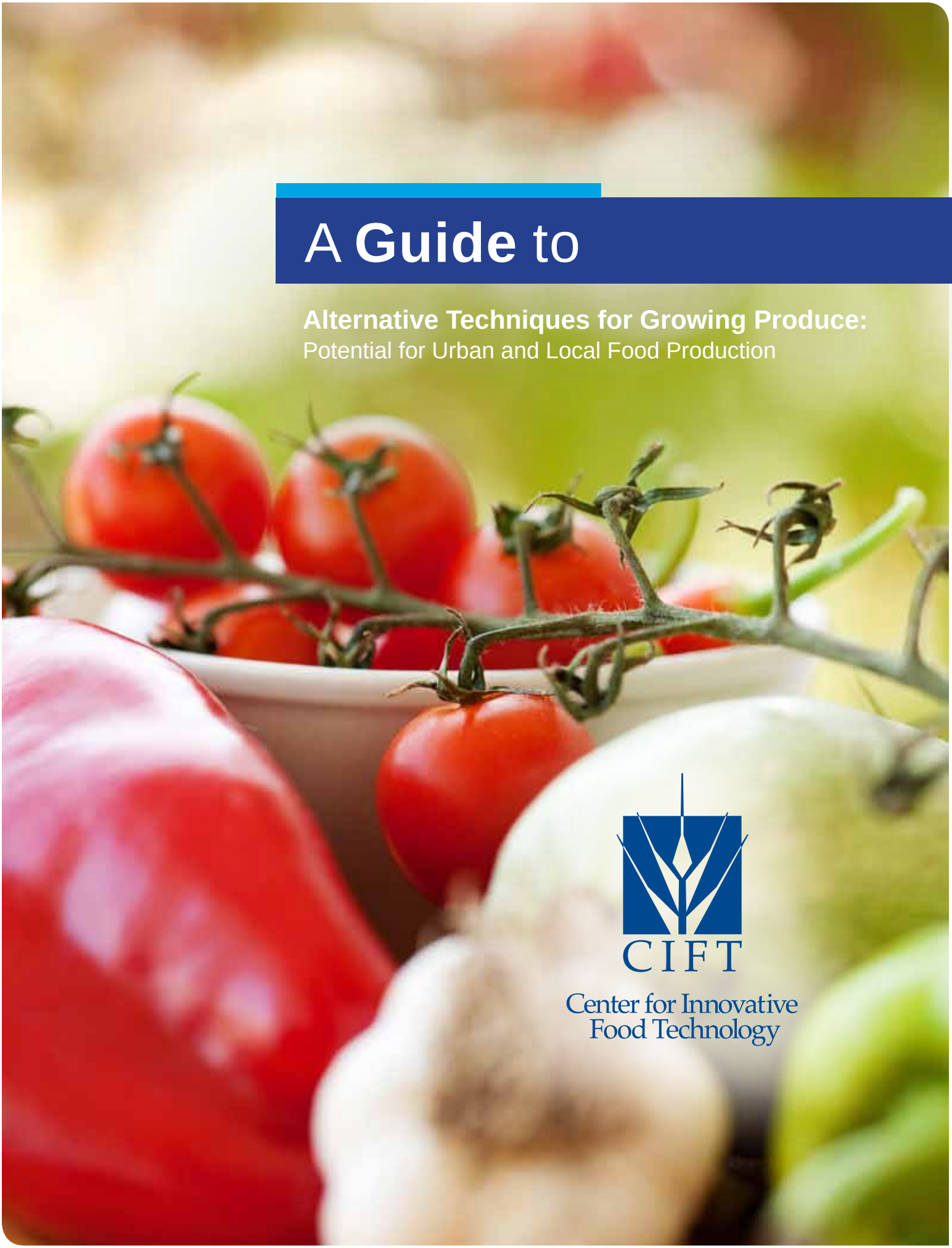

A **Guide** to

Alternative Techniques for Growing Produce:
Potential for Urban and Local Food Production

CIFT
Center for Innovative Food Technology

Efforts associated with this publication were supported by the Ohio Department of Agriculture Specialty Crop Block Grant program and CIFT. The intention is to demonstrate alternative methods of production for increased consumption of locally grown produce and specialty crops overall.

A **Guide** to **Alternative Techniques for Growing Produce:** Potential for Urban and Local Food Production

The Center for Innovative Food Technology (CIFT) provides technical solutions to companies involved in food and agriculture. The mission is to assist agribusinesses to improve their competitive position through the development and adaptation of emerging technologies, industry best practices, and novel business approaches. Within this scope, CIFT coordinates investigations into alternative growing practices and methodologies allowing for a unique capacity for increased food production. This publication is designed to assist individuals and organizations to evaluate various techniques and select the most appropriate method for production and increased consumption of fresh, local produce.

Hydroponic Vertical Growing System

A hydroponic vertical growing system is a multi-level unit, allowing for more food per square foot than most traditional growing practices. This innovative design allows for Styrofoam pots to be stacked on top of each other, creating an upward, vertical design. The system enables plants to grow on significantly smaller spaces and in varying ground covers from concrete to parking lots.

The system appeals to varying degrees of production from 64 plants to thousands of plants and in locations as diverse as deserted gas station parking lots to back patios. The vertical system has been installed at senior centers, hospitals, schools, churches, food banks, community organizations, and more. Regardless of the size or location, the results are consistent in that nutritional and quality produce is grown in a controlled environment with flexibility of location easing the logistical elements involved with delivering product to those desiring it. The system defined in this document is applicable for incorporation into an urban or agricultural settings and presents an effective solution to local food systems.

A hydroponic vertical system has the capability of growing a variety of fruits or vegetables not considered a “root” crop. Greens, tomatoes, green peppers, herbs, green onions, strawberries, and more excel in this growing environment. However, produce such as potatoes or carrots would result in excessive pressure on the Styrofoam pots, ultimately destroying the base. Selection of a crop depends entirely on the intended market or outlet for the produce.

A vertical system can be constructed in various sizes from four towers with four pots per tower, equating to 64 plants or upwards to a design for thousands of plants. Size determinations are based on allowable space available and cost factors as four towers cost roughly $400 while a larger system of 96 towers would cost $4,800, respectively (cost should be confirmed by the supplier as prices change). Miscellaneous materials commonly found at hardware or home improvement stores are also required to complete the system design. Due to the layout and format of the system, it can be readily expanded to meet increased production desires.

The common reference is that one acre of this system supports plants that would traditionally require eight acres of conventional farm land. A unique element to the vertical system is that it operates hydroponically. Hydroponics is a method of growing plants using mineral nutrient solutions, without soil. Terrestrial plants may be grown with their roots in the mineral nutrient solution only or in an inert medium, such as perlite, gravel, or mineral wool [(1)]. The produce grown in this particular system utilizes a coconut growing medium with the primary purpose of holding moisture and maintaining the root base. No nutritional value was contributed to the plants through the growing medium, rather solely supplied through direct nutrient application.

As standard in hydroponic operations, installed injectors allow for automatic watering by accessing barrels of water and the premixed nutrient mixture. The design for 2,100 plants incorporates rows of tubing upwards of 75 ft. long to utilize the pressure compensated emitters. A typical commercial operation includes 96 towers of five pots high with 12 towers per row equating to approximately 29 ft. by 48 ft. ground cover. The layout can be expanded or modified to fit the space allotted. A small system is approximately five ft. by three ft. as a footprint, including the nutrient barrel.

Planning assumptions include:

- Is there access to the essential utilities including water, electric, and plumbing (large units).
- What is the condition of the ground in which the system will be positioned? Ground soil or concrete impacts the installation process.
- Does the location have ample sunlight? Full sun is preferred as this could affect the growing process.
- What is the security of the location? Is this location protected from vandalism and potentially animals?

Upon determination of these and other factors, a feasible location can be identified for inclusion of a vertical garden.

Production potential

The production potential is reflective in the crop selected but can be very favorable with fast maturing items such as lettuce. A hydroponic operation can be installed and operating in early April or when the weather is deemed appropriate for optimal growing conditions. To avoid any delay in production, seeds can be started within a greenhouse and transplants incorporated into the growing system.

Within three weeks of planting, lettuce can be harvested. Two and three cuttings can be collected from the plants prior to obtaining a bitter flavor, common after multiple harvests. Once the first crop of lettuce has completed production, the plants are removed and a second round of greens can be planted directly from seed. Again, within three to four weeks, a harvest is expected. Other vegetables maintain traditional growing degree days for production.

The growing season typically lasts seven months, beginning in April. A late frost could impact the crops, but snow peas and collard greens may be able to tolerate the conditions. Typically, planting the second week of May will ensure productivity. Depending on the weather, most systems last until the end of October, without being covered.

If a vertical system is moved inside, plants can be grown for a longer period.

As mentioned previously, a vertical system operating as a hydroponic unit eliminates several environmental factors otherwise associated with production. Under conventional growing practices, unpredictable weather occurrences, insects, rodents, and soil conditions impact the results. When a hydroponic system is incorporated, the majority of these factors are controlled and readily monitored.

A timer is applied to the watering system enabling for consistent water and nutrient application to the plants through the controlled methods. The timer is set in a fashion that automatically shuts off after a period of time in which all the pots were saturated. This time allotment could be adjusted as necessary and is increased during the excessively dry, hot period realized in July and August. At the same time, water could be adjusted down if rains are plentiful. Conventional growing practices do not have the same luxury. Consistent moisture eliminates stress to the plant and enables the natural energy to be focused on growing and producing the fruit or vegetable.

In an effort to control insect infiltration without the use of pesticides, a natural inhibitor is applied. Marigolds are staggered throughout the system and planted in smaller containers on the top of the stacks. The natural repellent aspect of marigolds is that they excrete a smell that bugs do not like, thereby deterring insects. This was successful except for the Japanese beetle infestation.

Again, based on the hydroponic aspect of operations the soil conditions were not a factor in production capacity. All essential nutrients are directly applied throughout the growing cycle. *A Verti-Gro Hydroponic Nutrient Greenhouse* grade fertilizer is utilized in the system and supplied with the initial order of materials. From an economic standpoint, this is particularly favorable in the elimination of fertilizer costs required to bring soil conditions to appropriate nutritional levels. Equally, this confirms the ability to incorporate food production on marginal land or non-traditional locations without compromising quality of the product. In respect to environmental needs associated with a vertical system, the only requirement is a water supply and electricity to operate the pumps. Should the water supply be deemed unfavorable, in terms of high sulfur or iron content, there are additional options.

Operational Details

Labor costs inherently affect any business or production operation. Aside from the labor associated with physical construction of the system, the labor requirements are certainly manageable and favorable in comparison to conventional practices. Upon installation, the hydroponic elements of the operation address the watering aspects. In addition, the elevated nature of the vertical system controls weed emergence traditionally recognized when planting directly into the soil. The growing medium limits material from growing other than the intended plant inserted into the pot but does not prevent some random weed issues from materializing. To further assist efforts, the design of the towers is resting on a swivel plate enabling the entire stack to rotate 360 degrees. All of these combined elements equate to minimal labor inputs.

However, labor is not completely eliminated. Daily monitoring of the water volume, timer settings, and nutrient supply is required. Barrels are used to hold the water and nutrient mixture and need filled on a weekly basis, if not more when usage increases. Additionally, general observation of the plants is essential to ensure wilting, insects, or animal damage is not occurring. With regard to tomatoes, it is imperative to pinch the shoots in order to limit the size of the plant and place emphasis on the production of the fruit. Do not drape the plants over the top of the system as often done when growing with cages or stakes. In doing so, excessive pressure will be placed on the tubing, thereby threatening the water supply by kinks in the hose and added pressure on the poles causing them to lean or become uprooted. Similar issues can be associated with strawberries if not appropriately maintained.

The bulk of the labor involves the planting of the crop and harvesting of the produce upon maturity. The planting can be done by seed or transplant although it can be challenging to insert individual seeds into the corners of the pots due to the size of the seeds. Starter plants provide ease of inserting one into each corner, four to a pot. Harvesting practices are the same as conducted in traditional growing environments. The lettuce can be cut multiple times and tomatoes picked upon ripening.

For a small system, construction can be achieved with four people and the process could take approximately three to four hours. Time will vary with knowledge and with the amount of help involved. The materials needed for construction includes a tarp, mallet/slug hammer, block of wood, measuring tape, wheel barrel or large container, hoe or shovel, bucket, water and the supplies accompanying the kit.

Construction phases:

1. Position the ground cover in the desired location – at least four people to pull from the corners.
2. Setting post according to the instructions will require mallet/ slug hammer and a block of wood to keep from marring the poles.
3. Measure and mark the placement of the poles.
4. Place the poles at the indicated markings to allow for proper spacing.
5. Set the poles making sure all are straight and secure.
6. Once a row is completed, continue with placement of PVC, swivel, and pots.

Phase two:

1. Secure a wheel barrel or large container, a tarp or plastic sheeting, hoe/shovel, bucket, and water.
2. Prepare the medium by soaking in water and breaking apart from block.
3. Once the medium is loose, mix with perlite and begin filling the pots to ¾ full.
4. Cut an opening into the top of the barrel for inserting the. pump. Be sure to cover the opening in order to avoid foreign particles and contamination of the water.
5. Proceed with placing the pots on the poles, 4-5 per pole.
6. Insert transplant or seed into each corner of pot.
7. Ensure the timer, pump, and barrel are in operational order.
8. The timer will be periodic and short durations early in the season but increase frequency and length as the plants mature and weather warms.

Equipment Needs

The vertical growing system was designed for those who want to learn more about the potential for local food production. The manufacturer of the unit is Verti-Gro Inc. and information can be found at vertigro.com. The VGO-480L includes growing pots, irrigation system with adjustable ratio injectors, volt solenoid valves, filter, pressure gauge, check valve, sequence timer, rotating tower assemblies, and complete irrigation system. Optional items and supplies are needed to complete the system including perlite.

A purchased kit will include all the desired equipment and supplies minus the water barrel. Local sources can assist with a food grade option typically blue in color. Avoid white barrels due to the increased potential for algae growth. Upon proper handling of the supplies, additional costs in future seasons will include nutrients and growing medium, along with the cost associated with the plants.

Evaluation

With any inclusion of a garden, there are pros and cons associated. Based on findings from the past few years of operations at various locations, below is a summary of these findings for consideration.

Benefits:

1. Increased production potential in a reduced amount of space.
2. Minimal labor and monitoring.
3. Capable of growing a variety of crops.
4. The amount of water is less than typically used with a garden in the ground. This is a result of the use of a timer for automatic feed and ability to prevent waste or run off. Equally, the growing medium is capable of maintaining moisture for an extended period of time.

Disadvantages:

1. Need to purchase medium and nutrients every year.
2. Be aware of potential for mildew within the medium. The system must be properly stored with adequate ventilation to ensure air flow, or medium completely dried at the end of the season.

Is the Vertical System Right For You?

- What is the purpose for the vertical garden?
- What will you grow, how much, and when?
- Do you have a source for your plants or seeds?
- Who will manage, monitor and maintain the vertical garden?
- Who will assemble the system?

Economics of Production and Market

Although agriculture is the largest industry in Ohio, there is increasing potential for food production via a vertical system as demonstrated through this initiative. With expanding urban areas of Cleveland, Columbus, Cincinnati and Toledo, the consumers' desires are demanding increased local production. In addition, the educational aspects, community involvement, and increased nutritional factors continue to spur innovative production practices. Incorporating a vertical system into a standard production facility, within an urban setting or at an educational outlet ultimately experiences the same results – local, fresh produce generated for a consuming population.

References: *1. Definition of hydroponics per Wikipedia - http://en.wikipedia.org/wiki/Hydroponics*

2. Information from VGO – 480L obtained from Verti-Gro Inc., 800-955-6757, email: info@vertigro.com. Website: www.vertigro.com

Hoop Houses: A Method for Season Extension

A hoop house is a version of a greenhouse with plastic covering and season extension potential. Made of galvanized steel arches covered with polyethylene plastic, hoop houses are typically temporary frames with no permanent foundation. The structure features adjustable side vents, which provide a cheaper method of temperature control than traditional mechanical means. The interior heats up because incoming solar radiation from the sun warms plants, soil, and other elements inside the structure faster than heat can escape. Air warmed by the heat from hot interior surfaces is retained by the roof and walls.

Hoop houses differ from a greenhouse because traditional greenhouses are permanent structures, requiring a building permit to construct and usually heated. Hoop houses are mobile, temporary frames, and usually do not require a building permit although if constructing within an urban location, verify through the appropriate city departments prior to construction. If the lot is not properly zoned or the location is within specific parameters, a permit may be required. Most hoop houses are heated only by the sun and are ventilated naturally by design and manual manipulation of the sides or doors.

Hoop houses can be a beneficial investment because growing seasons are extended, and therefore, revenue is increased. Although hoop houses come with higher capital expenses compared to other growing systems, the structure can maintain a life span of 5-7 years with year round crop production.

Essentially, hoop houses are portable arched ground covers usually constructed of hoop shaped tubular (galvanized steel or PVC pipe) arches covered with special plastic film to enhance the growth and protection of various vegetables, berries, and flowers. These structures are placed directly over the ground intended for planting and serve as a means of lengthening the growing season (from start to finish) and controlling

the environmental conditions for the plants that would otherwise be completely at the mercy of Mother Nature's inconsistency.

With ingenuity and much planning, growers and gardeners have found an amazing way to help reduce the risk associated with the weather and are producing more and better fruits and vegetables.

The following list of hoop house benefits will help determine if a hoop houses fits your operational desires.

Extended growing time – Hoop houses can extend the growing season by an extra three to four months.(4) In a competitive marketplace, growers can get the jump on customers' cravings for locally grown fruits and vegetables. With good planning, multiple plantings and different plant varieties, growers can extend the normal availability period for short-season fruits like strawberries.

Relatively inexpensive startup costs with quick cost recovery – Most sources report costs at approximately $2-3 per square foot, with a cost recovery period of approximately one growing season.(4)

Effective protection from predators and weather extremes – Enclosed hoop houses naturally afford protection from birds, rodents, deer and domestic animals. Insect infestations can be minimized, but not completely eliminated due to the need for open-sides during ventilation; however, the hoop house environment is conducive to using beneficial insects more effectively. Birds, rodents, etc., can be discouraged with a fabric mesh as needed. Weather extremes are evened out by hoop houses; excessive rain, sun, heat, cold, hail, high winds, and untimely frosts are all minimized by the protective frame and covering of the hoop house. One hoop house grower points to protection from spontaneous and sometimes highly damaging storms as a major benefit of hoop house use.

Longer growing season affords variety of plants and grower ingenuity in terms of market strategy and planting schedules – Using different varieties with varying lengths of growth time in multiple plantings, growers can maximize harvests and availability periods of fruits and vegetables. For example, successive plantings of different varieties within an extended growing period can make triple cropping possible where only single or double cropping would otherwise be achieved.

Hoop house kits are available through local greenhouse suppliers and can vary in size based on space availability and operational desires. Hoop houses can be warmed and cooled naturally – costly equipment is not necessary. Rolling or rising up the plastic on the sides and opening up doors/ windows is usually sufficient to provide good ventilation.[4]

Hoop houses can withstand wind and snow with proper placement and minimal maintenance (such as snow removal) as necessary to prevent damage. The vertical space with a hoop house allows the grower to maximize use of land space by adding purlins for hanging plants and tie up vining for taller plants.[4]

Based on the year round production potential, crop planning is critical. Heat loving vegetables such as tomatoes, cucumbers, peppers thrive during the late spring and summer. Cold hardy vegetables including spinach, arugula, lettuces, beet greens, kale and mustards are a perfect compliment to the fall and winter growing cycle. Production is possible during the cooler months but only with the cold tolerant plants as they will be dormant for a portion of the time.

When growing for profit, the strategy is to plant and harvest the right crops at the right time for the right customers - stretching the growing season and number of harvests effectively. With proper planning and an established crop scheduling procedure, produce can be harvested upwards of 4-6 weeks prior to the traditional crops. This enables a premium price in a market demanding fresh, local product. Frequently the question arises as to the benefit of growing within a hoop house in the summer months. The benefit of doing so correlates to the defined crop schedule and enables plants to mature more rapidly and experience growth following the first hard frost.

Knowing the ideal growing temperatures for the various crops, the length of time each takes to mature, the estimated length of growing time available (factoring in the extended time afforded by using the hoop house in the space), will be critical to developing a strategy reflective of the desired crop outcome and yields.

Production potential is a rough estimate as all records and operational details are handled differently. The Samuel Roberts Noble Foundation averaged 648 and 1,918 pounds per house of spinach and tomato, respectively and 518, 452, and 318 pounds per house of strawberry, yellow zucchini and squash.

In terms of additional cost it is recommended that a builder construct the hoop house and therefore the materials and builder fees are an additional expense. Sometimes, builders charge equivalent to half of the cost of the hoop house for the construction. The cost of an electrician and plumber are necessary for lights and a water line. Additionally, proper drainage surrounding the structure is advised and may be an added expense.

Important Planning Considerations

To take full advantage of the extended growing season afforded by hoop houses, experts recommend keeping good production records, comparing notes with local farmers, and recognizing the cool-season and warm-season effects on seedling establishment and crop growth.[1] An important starting point for planning is the average annual frost-free date in the spring, and the average annual first-freeze date in the fall – as well as knowledge of optimum soil temperature for planting of various crops.

The location and preparation of the hoop house site(s) are also important, as well as the materials to be employed. In other words, planning is extremely important.

Soil Temperature Germination Ranges for Select Vegetables

TEMP. °F	PLANT
45–85	**cabbage, kale, broccoli, collards** (germinate well at 85; seedlings prefer 45–65)
35–80	**lettuce and most salad greens** (at more than 80, germination rate drops 50%)
35–75	**spinach** (optimum 65)
50–85	**onions** (optimum 75)
45–95	**radishes** (optimum 85)
50–85	**beets, Swiss chard** (optimum 85)
60–85	**beans, snap & dry** (optimum 80)
70–85	**beans, lima** (optimum 85)
40–75	**peas** (optimum 75)
60–95	**corn** (optimum 95)
65–82	**tomatoes** (optimum 80)
60–95	**peppers** (optimum 85)
65–100	**cucumbers, melons, squash** (optimum 80–95)

From *Market News*, March 1990

Planning through Recordkeeping

Good recordkeeping is the best way to know if your efforts are profitable. Records need to document the cultivars used, cultivation methods, pest management efforts, harvest schedules, labor utilized, equipment, expenses, as well as packing and sales records. A good planting schedule that results in a manageable and continual harvest requires compilation of several kinds of data and a detailed plan based on the information. Although historical records are the best indicator of future outcomes, research data is available to develop a starting plan and add data from actual experience for future reference.

Source: Scheduling Vegetable Plantings for Continuous Harvest, www.attra.org/attra-pub/continuousharvest.html

Location and Site Preparation

In addition to site considerations such as moderately level ground with good drainage and good soil, select a spot where the sun is not blocked by trees and other obstacles. On the other hand, if the prospective site is totally unprotected from high winds that are known to whip through and also cause excessive snow build-up, take this into account and either choose another spot, or reinforce the structure accordingly.[6]
The hoop house will need an irrigation system and/or water, so it is important to locate the structure near a water source or in a place where a water tank can be located nearby. Remember that a water hose works fine for irrigation in the warm months, but is not practical for cold weather watering.

Temperature Management

Crops in the field are at the mercy of the climate of the day. Crops under hoop houses, however, have the hoop house to protect them from the extremes. Most often, people think of greenhouses and hoop houses in terms of keeping the plants warm in cold weather. But many hoop house users and manufacturers warn that too much heat can be more of a problem than cold. Temperature management within the hoop house is vital to success. First time growers often underestimate the capacity of the house to gain heat especially on cloudy days. As a rule of thumb, hoop houses should be vented before internal air temperature reaches 90 degrees.[8]

Hoop house temperature is regulated by adjusting the side vents to maintain the desired temperatures. By rolling down the sides in the early evening, heat can be trapped to help during cool weather. Later, as night temperatures begin to stay above 65 degrees, the sides can remain open. Hoop house growers recommend a mini-max thermometer for monitoring the temperatures throughout the day; these specialized thermometers will record the maximum and minimum temperatures within set time periods and can be purchased for less than $30. They also recommend closing up the hoop house before retiring for the night if the forecast calls for overnight rain.[8]

During cool and colder weather, the crops inside the hoop house (ideally, plants that are more tolerant of these temperatures) are kept several degrees warmer than field crops. Some growers use row covers to capture ground heat. An inner tunnel can be constructed approximately three feet above the ground surface. Rolling this cover back early in the day enables the sun to warm the soil and then covering the space again by mid-afternoon will maintain the warmth and provide protection during the evening hours. More ground heat is captured by covering the spaces between rows.

Ventilation is purposefully enhanced by strategic orientation of the tunnels to take advantage of the prevailing winds. Also, the tunnels are kept under 50 feet long with wide doors on each end for efficient ventilation throughout and without fans.

Irrigation Planning and Knowledge

Mother Nature will not be watering the crops inside the hoop house, so the grower not only has to provide a good irrigation system, but also has to know how much to water, and when to water. The effort generally pays off, especially for such crops as tomatoes that are affected significantly by the timing and quantity of water.

Extra layer of poly for added winter warmth.

Drip or trickle irrigation is the most often recommended means of watering in a hoop house; this method conserves water, and delivers it where most needed. Irrigation within the hoop house can be scheduled in much the same way as field irrigation. Water is needed in the winter months too, although not as much, according to Adam Montri of the Michigan Food and Farmers System (MIFFS). Mr. Montri recommends a watering every 7-10 days in the winter, early in the day on a sunny day so that the water will dissipate before dark to avoid freezing the plants.[7] The drip irrigation system in the hoop houses associated with MIFFS are not buried in the ground, so drip irrigation is not used in the winter. Instead, they use frost free hydrants that are buried. The water in these hydrants drains

completely out when you turn them off, thus avoiding freezing. A hand held watering wand and hose are also used in the winter, which are drained between uses.

Orientation of Hoop House

Hoop house manufacturers stress the importance of capturing the most light in winter when deciding how to orient the hoop house on the property. Frequently cited advice suggests that for "locations north of 40 degree latitude, the ridge should run east to west. For locations south of 40 degree latitude, the ridge should run north to south."[2] It is also important to prevent one hoop house from casting shadows on one next to it as the sun advances each day. However, prevailing winds are a more important consideration to at least one expert; Dr. Lewis Jett in Columbia, Missouri. He says that sunlight is less important than ventilation, and thus a high tunnel should be oriented perpendicular to prevailing winds.[5] In areas where plants might be more susceptible to extreme heat than lack of winter sunlight, the orientation should maximize ventilation over sunlight.
The direction of the rows within the hoop house may take better advantage of the soil temperature in different areas of the structure. A preferred option is to run rows parallel with the hoops (the short dimension of the space) with walking aisles on the sides. The area in the center of the hoop house is the warmest, so using the center for plants instead of people makes more sense. This also provides a bit of a buffer area on the sides to help protect the plants on the end of rows from colder temps, wind, and movement of the side plastic for ventilation.

Costs and Other Specifics

Hoop houses can be ordered as ready to assemble kits, or plans and materials can be purchased separately for construction. Cost estimates from various sources range from a low of $1 per square foot to upwards of $3 per square foot, excluding labor, depending on design and whether or not additional materials are required to complete construction (such as lumber for end walls and baseboards). Standard hoop houses range in width from 20-30 ft. and length up to 96 ft. (most of the poly covering is available up to 96 ft.).

A recommended structure is 30 ft. by 96 ft., gothic design (to help deal with the snow), and two layers of greenhouse poly covering the hoops; single layer of greenhouse poly over the ends. In addition, an inside extra layer of poly and a low frame needs to be purchased to offer more cold protection. The extra piece of plastic, the lumber, roll-up pipe, and the EMT conduit to support the interior structure added approximately $410 to the cost.

Preparing for a Hoop House:

1. How will the system be constructed? Will you gather volunteers or hire a contractor?
2. Where will you purchase a hoop house kit? Most kits are available online or through local suppliers.
3. Does your area require a building permit? Most do not, but it is always advisable to check local requirements.
4. What will be your method of crop irrigation?
5. Do you have a crop schedule planned?

Publications for Additional Insights:

Source: Hightunnels.org, Growers using high tunnels http://hightunnels.org/resources.htm#GrowersUsingHighTunnels

Four Season Harvest:
Organic Vegetables from Your Home Garden All Year Long.
Eliot Coleman
1999, 212 pages
Chelsea Green Publishing
www.chelseagreen.com

The Hoophouse Handbook
Lynn Byczynski
2003, 60 pages
Fairplain Publishing, Inc.
www.growingformarket.com

The New Organic Grower:
A Masters Manual of Tools and Techniques for the Home and Market Gardener.
Eliot Coleman
1995, 340 pages
Chelsea Green Publishing
www.chelseagreen.com

Season Extension Techniques for Market Gardeners
Janet Bachman and Richard Earles
2000, 24 pages
ATTRA
www.attra.org

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(3) Frey, D. (Fall 2006). Stewardship and nature sustainable energy systems on the farm, three sisters farm in Sandy Lake, PA, has been exploring innovative, energy-conserving technologies since 1988, you can too. Retrieved from http://www.smallfarms.cornell.edu/pages/quarterly/archive/fall06/Fall_2006_Page_8.pdf on June 12, 2007.

(4) Hoop house greenhouse. Retrieved from http://www.lawnandgardenmagic.com/Greenhouse-Gardening/Articles/A_Guide_To_Hoop_House_Greenhouse.php

(5) University of Missouri. Tomato production. Retrieved from p.28 within http://attra.ncat.org/attra-pub/PDF/seasonext.pdf.

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(8) Upson, S. (April 1998). Hooping it up observations from two years of hoop house vegetable trials. Retrieved from http://www.mtruncatula.org/Ag/Horticulture/HoopVeggieTrials/PrintLayout_1_86053_86053.html.

Grow Soxx: Contained Production

Grow Soxx, woven biodegradable knit socks, filled with organic material, soil, and fertilizer and are manufactured to work in dry areas with the aid of a drip irrigation system. They can also be used in low areas where water collects. Grow Soxx can be purchased from Filtrexx in Cleveland, Ohio. These will typically produce due to the utilization of the mesh enclosure that controls moisture and exposure to air on all sides and can be grown virtually anywhere.

Attention to placement is critical to productivity with this growing method. Sufficient sunlight is needed to ensure ample growth potential. Equally critical is access to water. The black mesh and confined space for plant growth results in rapid depletion of water. If substantial amounts of water are not available due to a low terrain, a supplemental water source will be critical. Upon planting, each sock will be fully saturated in order to ensure immediate plant growth. The moisture level needs to remain consistent in order for continued plant health and productivity without over saturation resulting in molding issues.

The Grow Soxx is relatively small measuring between 2-3 ft. long and easily positioned next to buildings, sidewalks, or patios. A variety of crops have proven productive within this technique including, but not limited to, herbs, lettuce, tomatoes, peppers, spinach, mustard greens, collard greens, broccoli, and more. Depending on what is planted and the conditions in which these are managed, the production potential can be favorable for each sock unit.

Preparing for a Grow Soxx:

1. Where will you place your Grow Soxx?
2. Will it receive enough sunlight?
3. Will it receive enough water? If it does not receive a substantial amount of water, will you be able to provide a watering source?
4. What will you grow? How much will you grow and when?
5. Who will manage, monitor and maintain the Grow Soxx?

The nutrient balance has performed for up to three years before testing will be necessary to ensure no lack of nutrients due to prior crop depletion. Toward year three, less nutrient dense crops can be rotated into the production in order to maximize all available nutrients. The growing season associated with this method of production is consistent with that of a traditional garden in the start being when temperatures become stable through the first hard frost.

The cost per sock is approximately $15 for the two ft. version and $25 for the three ft. option respectively. A bulk purchase may equate to a lower rate or discount on shipping but negotiated through the supplier at gardensoxx.com. All contact information and updated pricing should be obtained directly from the supplier. Additional costs are related to seeds or transplants that will be inserted into the sock as well as a source of water.

This production method has minimal maintenance associated and the labor is applied upon set up, planting and inclusion of a water source. Following these activities, harvest will be the next requirement. Minimal weeds are associated with the technique or application of nutrients. Upon harvest, plants can be removed and the socks stored until the following spring when they can again be positioned and replanted for a second crop cycle. A challenge associated with this practice is with respect to insects, pests, and animals as the height and accessibility is ideal for such impediments to production. Constant monitoring will assist in favorable yields.

Raised Beds: Above Ground Production

A more traditional production approach may be appealing to growers who have nutrient rich soil yet limited space for inclusion of a structure such as a hoop house. Gardening in raised beds has experienced resurgence in popularity where tillable land is limited yet access to fresh produce in demand.

The “raised” part means that the soil level in the bed is higher than the surrounding soil, and “bed” implies a size small enough to work without actually stepping onto the production space. A bed should be no wider than four feet, but length can be whatever suits the site or gardener’s needs. Wider beds can be subdivided into sections accessible from planks or stepping stones. The bed does not have to be enclosed or framed, but if unframed, the use of power tillers is feasible.

Raised beds do not require the usual space between rows because no walking is done in the bed to cultivate or harvest. Hence, vegetables are planted in beds at higher densities - ideally spaced just far enough apart to avoid crowding but close enough to shade weeds. This practice can be applied within hoop houses or in back yard garden environments.

Utilizing a raised bed approach will allow for improved soil conditions and controlled nutrient base. The lack of equipment being used, compaction from foot traffic and ease of added soil will ensure sufficient water and air penetration further benefiting the root base of the plants. The framed approach applied to the bed will limit excess water saturation if placed in a traditionally low space or on unfavorable terrain. Reasonably, beds could be placed on stone slabs as long as sufficient soil is maintained in the bed and runoff is limited.

Operational details:

A gardener benefits from a raised bed approach due to the design allowing for access to the plants without walking through the growing area. At times, weather conditions limit access to a garden while this is avoided when using a raised bed approach. Spaces between beds could be mulched or even surrounded by stone in order to improve the visual appearances and accessibility of the owner.

Impeding pests are often an issue in a garden wherein produce is tempting for rodents and other animals. With a raised bed approach, the bottom of the beds can be lined with cloth to limit access or netting attached to the top for additional defense. The narrow dimension accommodates flexible frames for plants with height. Weed control with plastic ground cover is also a practical application since the width of the bed is equivalent to the width of the material.

The dimensions of beds are advantageous for water conservation. There are several watering systems that ensure the water gets only where it is needed. Canvas soaker hoses, perforated plastic sprinkle hoses and drip-type irrigation disperse water in a long, narrow pattern well-suited to beds. They also reduce disease by directing water to the soil instead of wetting leaf surfaces as with overhead irrigation.

The growing season for raised beds is determined based on if positioned outside or within a low tunnel system. Outside production reflects the standard growing season with conclusion at the first hard frost, however, undercover can result in production upwards of nine months. Additionally, the maintenance associated with raised beds is nominal with attention to the integrity of the wood used and method of watering. Integration of fresh compost each season will assist in nutrient balance and minimize disease.

It is difficult to estimate the cost for raised bed production as that is determined by the price of wood and materials. Cost will vary depending on the number and size of boxes constructed and type of wood. Additional expenses are no different than any garden as reflected through soil enhancements, plants, hand tools, and materials for a low tunnel, if desired.

Benefits associated with raised bed production include weed control when the crop is planted in a solid versus row approach. Equally, the beds can be constructed to meet the physical requirements of the people managing the garden. Narrow width allows for easy access across the growing area and added height favors improved access.

The disadvantages are reflected in the impact of warm temperatures and moisture on the bed itself as degrading can result and replacement pieces required. Equally, the environment just mentioned is an attractant to animals and pests so proper control agents are necessary that will not negatively impact food safety precautions. Plants need to be positioned slightly away from the wood to ensure chips are not introduced into the plant, again a food safety concern.

Construction Tips

Guidelines to remember in raised bed construction

Keep the beds narrow and match their length to the operational desires and watering system. A north-south orientation is best for low-growing crops, allowing direct sunlight to both sides of the bed. Beds that will contain taller crops such as caged tomatoes might do better on an east-west configuration.

Avoid the use of treated lumber for bed frames. These chemicals can leach out and impact plants. Pressure-treated lumber is the recommended material for construction. Depending on placement of the raised bed, utilizing the existing soil will compliment the compost added for increased nutrient capacity. It is recommended that soil is tested to ensure the proper balance of nutrients for plant growth.

The configuration of raised beds can be modified according to the needs of the manager such as elevated for easy access and convenience to seasonal extension. Since the soil temperature within raised beds increases at a faster rate than the ground, these units are often covered for an early start to the growing season.

Unlike typical gardens with seeds positioned in rows, raised beds allow for solid seeding as a method for weed control and increased productivity per square foot. Additionally, by nature of the raised bed approach, the foot traffic is limited and thereby reducing the compaction of the soil. This again results in the improved drainage and natural growth accelerators. Ridge tillage, solid seeding and controlled traffic are all new techniques designed to deal with drainage, weed or compaction problems and to increase productivity. Many of the same principles used in raised beds are being adopted on a larger scale in field crops.

Preparing for a Raised Bed:

1. What type of material will be used to build the raised beds?
2. Will the site be indoors (in a hoop house) or outdoors?
3. Determine the size of the garden.
4. Soil content and composition adequate for growth?
5. Access to water source?

Resources:

Ohio State University Extension Fact Sheet; Horticulture and Crop Science, Raised Bed Gardening, HYG-1641-92.
http://www.ksre.ksu.edu/library/HORT2/MF2134.PDF

Consumer Perceptions on Urban Produce:

According to a 2011 “Our City in a Garden” survey (Toledo, Ohio), the top three categories consumers search for in a product include where the product originated, the quality associated with the product, and freshness.

Customers were given a survey at two farmer’s markets where product grown in urban settings was on display. When asked what is most appealing about this product, the popular answer was “all of the above,” which included, grown in your own neighborhood, managed by a familiar organization, locally produced and fresh.

Once a product is sold at a farmer’s market, customers must chose among price, quality, location it was grown and the type of product. According to the survey, consumers are most conscientious about the quality of the product sold, with the price a strong factor.

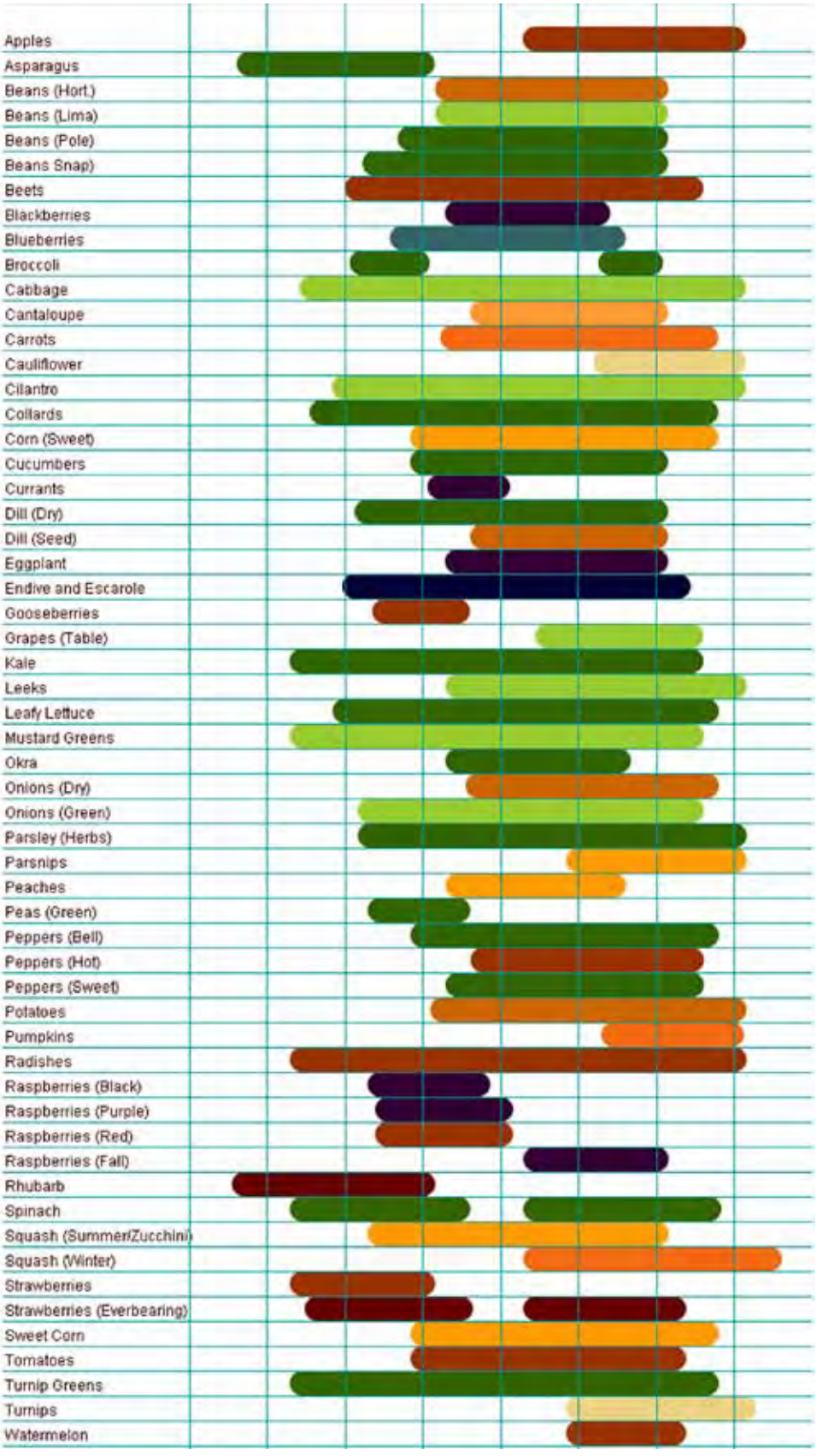
Other important details resulting from the survey include approximately 70 percent of the respondents would be willing to pay more for products from Toledo and 94 percent would purchase the product over another if it were in the grocery store.

Overall, consumer perceptions and responses to product originating from an urban location and managed by an organization or community were deemed favorable. However, it is worth noting that all of the positive attributes mentioned could also be said for product sold at the market by a rural producer as well. Therefore, it would seem as though the method of production is not as prominent a factor in purchasing decisions as the fact it is locally grown, fresh, and of impeccable quality.

Food Safety Guide Available

A complete set of voluntary guidelines is available from the U.S. Food & Drug Administration’s Center for Food Safety and Applied Nutrition entitled “Guide to Minimize Microbial Food Safety Hazards for Fresh Fruits and Vegetables”. These voluntary guidelines are not regulations. The use of these guidelines is encouraged for all stages of fruit and vegetable production, handling, and distribution to reduce the risk of microbial hazards. Similar documents are available and recommended prior to engaging in food production.

Ohio Produce Availability Chart



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