



**Specialty Crop Block Grant Program
(SCBGP)
FFY 13
12-25-B-1668**

Final Performance Report

Illinois Department of Agriculture
State Fairgrounds
801 East Sangamon Avenue
Springfield, Illinois 62702-1813

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SC-14-01

Illinois Specialty Crops, Agritourism, and Organic Conference Block Grant Final Report

Project Title: Illinois Specialty Crops, Agritourism, and Organic Conference – January 2015

Project Summary

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

The Illinois Specialty Crops, Agritourism, and Organic Conference provides educational sessions at their January conference which have an impact on the entire specialty crop industry - from growing fruits, vegetables, and herbs both conventionally and organically and providing value-added opportunities by incorporating agritourism activities into the producer's operation. Not only do producers have the opportunity to learn production and marketing techniques but they have an opportunity to learn how to sell an "experience" at their farm market by incorporating agritourism activities.

The program also addresses various aspects related to entering and competing in the wholesale market arena. Issues to be investigated include invoicing, pricing, marketing, packaging, supply, labeling, delivery, insurance, quality assurance, certification and audits. This portion of the educational agenda has a good fit as wholesale markets search to satisfy demand for local produce and producers search for additional marketing opportunities.

A trade show featuring cutting-edge technology gives producers an opportunity to view equipment, crop protection products, new fertilizers, new seed varieties, packaging supplies, new marketing opportunities through MarketMaker, greenhouse infrastructure products, food products available for resale in a roadside market (i.e. bakery items, jams and jellies, etc.), crop insurance products available to producers which enable them to manage risk, and exhibits geared to producing produce organically and how to comply with the National Organic Standards.

This conference benefits the specialty crop industry by incorporating both conventional and organic production practices and provides opportunities for producers to market their production through retail and/or wholesale outlets. It also provides information to roadside marketers on how to incorporate agritourism activities which will provide a value-added opportunity to their operation.

Establish the motivation for this project by presenting the importance and timeliness of the project.

Because of the huge interest in local food, organic and value-added, this conference is the ideal opportunity for producers to start the learning process in these areas or become further educated if already in the business. We have a lot of interest from new and beginning farmers and see a lot of new and younger faces than in conventional agriculture conferences. This goes to show the popularity of the local food movement and the interest generated in specialty crop farming as a result.

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

This is a different and stand-alone conference each year, but we do build on previous workshops and subject matter as we plan each year for the next conference.

Project Approach

Briefly summarize activities performed and tasks performed during the grant period. Whenever possible, describe the work accomplished in both quantitative and qualitative terms. Include the significant results, accomplishments, conclusions and recommendations. Include favorable or unusual developments.

Conference planning begins in early June with a team of around ten individuals with the goal of having all programming in place by September 1 so that our graphic artist has ample time to prepare the pre-conference brochure. We send out the Exhibitor Prospectus in late August soliciting trade show vendors and then follow up in November by contacting past exhibitors that have not yet committed for the coming year to get them on board. After the pre-conference brochure is prepared, we put together a press release that is sent to various outlets (see i. Conference Promotion below). The pre-conference brochure is mailed mid-November, and speaker confirmation letters are also sent in mid-November. Exhibitor confirmation packets are mailed in early December. Conference registrations begin to arrive from early December up until the time of the conference in early January. In mid-December, the graphic artist prepares the conference signage and the on-site brochure (which is different from the pre-conference brochure). We then begin assembling attendee packets which include the on-site program, speaker listing, exhibitor listing, evaluation, membership brochure, and dues form. In early January, pre-registration is cut off, and name badges are prepared. A team of five individuals work the registration desk throughout the three-day event (on-site registration is available), and two AV technicians assist the speakers in the seven breakout sessions with loading their PowerPoint presentations and trouble-shooting difficulties that may arise electronically.

All aspects of conference preparation went extremely well. Our biggest challenge continues to be attendees who wish to register after the deadline in order to avoid the higher on-site registration fee. We moved our registration deadline up earlier from the year before, but we still have last minute registrations mailed or faxed that we either must process or defer to on site. We provide lunch to all attendees on Thursday and Friday as part of their registration fee. This continues to be popular with the attendees so that they don't have to bother with paying cash in the lunch line and just present a ticket instead. We slightly raised the registration fees to offset some of these expenses.

The conference does charge a fee to attend the one-day workshop and/or the two-day conference. Grant funds are used to pay for expenses associated with specialty crop speakers and topics. Registration and exhibitor income is used to pay for expenses for specialty crop speakers above the grant amount and also covers non-specialty crop topics and speaker expenses. Registration and exhibitor income also covers food-related expense, supplies, etc. After taking into account our registration/exhibitor income and grant income, any revenue generated above and beyond expenses (if any) goes toward future conferences. All income stays within our conference budget and financials.

The nearly 100 speakers that we recruit to put on this three-day event are identified by the Program Area Coordinators primarily from the University of Illinois who are acknowledged in the next section by name. These coordinators are familiar with university personnel around the state and from other states as well as individuals from state agencies. They are also familiar with the farmers that we use for the various farmer roundtable panels and breakout sessions.

The block grant covers all the speaker expenses except for one half-day track. The organic sector provides two breakout tracks at the two-day conference. These two breakouts deal with specialty crop production with the exception of a two-hour time slot on organic livestock production. The IOGA (Illinois Organic Growers Association) pays for the organic livestock speaker expenses, not program funds.

The topics covered during this conference cover all aspects of the fruit, vegetable, herb, and agritourism industries, including conventional and organic farming methods. All topics were very well received and received very high ratings on our questionnaire.

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

Diane Handley, Manager, Illinois Specialty Growers Association, serves as project leader for the Illinois Specialty Crops, Agritourism, and Organic Conference. Project partners include Illinois Department of Agriculture and University of Illinois. A project team consisting of representatives from academia assists with the development of the agenda for the conference. The team includes staff from University of Illinois and the Illinois Specialty Growers Association.

University of Illinois: Rick Weinzierl, Mosbah Kushad, Mohammad Babadoost, Chuck Voigt, Nathan Johanning, Steven Ayers, Andrew Larson, Jeff Kindhart, Deborah Cavanaugh-Grant, and Elizabeth Wahle.

Goals and Outcomes Achieved

Supply the activities that were completed in order to achieve the performance goals and measurable outcomes for the project.

Conference Promotion: Press releases were sent to *FarmWeek*, *Fruit Grower News*, *Vegetable Grower News*, *American Fruit Growers*, *American Vegetable Growers*, the *Packer*, the *Grower*, *Country Folks Grower*, *Illinois Edition of Iowa Farmer Today*, *Illinois Times*, *Farm World*, county Farm Bureau managers, Extension service, and all Illinois newspapers with an ag section. Radio interviews were conducted with RFD Illinois three times. A pre-conference brochure was sent to all past participants.

Trade Show Promotion: Sent exhibitor prospectus to past and potential exhibitors, contacted past exhibitors who did not respond to the the initial prospectus, and sent exhibitors a listing of conference attendees within 30 days of the conclusion of the conference.

Conference Planning: Team leaders met to discuss potential educational session topics. They then met with affiliated association committees to brainstorm topics of interest and were encouraged to confirm speakers and their topics by September 1, 2014. At that time, team leaders were requested to send to the conference coordinator the titles of sessions, presenter's name, and contact information in preparation for the pre-conference flyer mailing and the speaker confirmation packets.

Membership promotion: ISGA membership was solicited throughout the conference via pre- and on-site registration. Participants are offered a conference registration discount if they are association members.

Attendance and Participation Goals: We continue to strive and meet the goals of web site participation, conference attendance, and increased association membership. Our numbers usually slightly increase from year to year or at the least are maintained, but these numbers are largely contingent on the weather in early January, which is precarious at best. We are very pleased with our attendance numbers in an era where most commodity-type conferences continue to decline in attendance and most associations continue to lose membership.

Market Maker: Producers met with Market Maker staff in order to register their farming operation and list their products available, method of sale, and farm location.

Evaluation Form: Attendees were encouraged to complete an electronic evaluation at the conclusion of the conference. We like to gauge what their favorite topics/presenters were and also solicit programming solicitations for the following year's conference. 2016 conference planning will take into consideration suggestions gleaned from the 2015 evaluation results.

Food Safety: We continue to incorporate food safety sessions and/or market preparedness in our workshops. Because of proposed federal legislation, we know the market is moving in the direction where GAP certification will be required. We have been taking a proactive approach to meet those federal and buyer requirements by offering continued education of this important safety topic at our conference each year.

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

It would be difficult to state long-term success when the cycle of farming is cyclical, but we are highly optimistic that every single attendee received information that will contribute to their long-term success as a producer in the specialty crop industry. If survey results are factored in, the conference scored in the "Excellent" range consistently, so it seems messages were received.

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

Increase conference attendance by 5% over 2014 attendance: The number of participants who attended the conference decreased slightly from the previous year due to freezing temperatures which cancelled schools and kept some people home. Conference attendance normally ranges from 600-675 so this year we were just slightly over 600 which was still respectable in this day and age of declining participation in conference attendance.

Increase trade show attendance by 5%, measured by an increase of exhibitors measured through our attendance comparison report. This year we sold 64 trade show booths (vs 70 from previous year) and were very pleased with the mix of exhibitors which was varied and covered all aspects of the specialty crop industry. Since our average number of exhibitors over the last five years is 60, we were very pleased with the number of exhibitors who signed on.

Develop educational programming with topics that will assist producers with their decision making in 2015. Each year the program coordinators evaluate the previous year's surveys and solicit conference topics through various venues in advance of the actual program planning session. The pre-conference workshops and breakout sessions are a direct result of this feedback, and surveys continue to tell us that we reach the needs of our attendees.

Increase ISGA membership by 5% by promoting membership value at the registration desk at the conference. We signed 25 new members to the Illinois Specialty Growers Association as a result of promoting membership at the conference for a total of 244 members to date which is comparable to last year's membership numbers.

Increase visits to the Illinois Specialty Growers Association Website 25% over the course of one year from the current 10,000 hits by measuring website visits each month over the next year. The ISGA web site is promoted year round through the newsletter and summer field events but visibility of our web site is highest during the October-January time frame when conference promotion is in full swing. Total web site hits for this year were 21,000, and we continue to see the largest jumps in "hits" during the months preceding the conference.

Provide a program for producers regarding "Good Agricultural Practices," which will provide assurance to the consumer that their produce is safe. At the 2015 conference, our goal is to increase attendance for this workshop and ensure that all producers are aware of the most current food safety requirements. The program planning committee elected not to have a full-day workshop on this topic but instead intermingled food safety programming through the three-day event in various educational tracks.

Provide a program where producers can meet with market channel buyers such as grocery retailers, schools, universities, foodservice distributors, and restaurant buyers in order to discuss requirements needed in order to develop professional relationships. At the 2015 conference, our goal is to increase attendance for this "Meet the Buyers"(MTB) event and ensure that producers are receiving adequate information to meet retail requirements. Because this goal and grant

request was written two conferences in advance of the actual 2015 conference, we have since discontinued the MTB event at our conference due to stand-alone MTB events throughout the state. We do, however, actively promote these events to our audience via information in the attendee portfolios and a table top exhibit.

Evaluate the conference by completing attendance summaries, making comparisons with previous years, and by having attendees complete a conference evaluation of session topics, speakers, and facility. Increase completed conference evaluations by 5% when compared to a year ago by providing incentives to attendees for completing evaluations. This year we moved from paper surveys to electronic surveys, and our returned surveys jumped from 60 completed surveys to 90.

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

Addressed above.

Beneficiaries

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

This conference benefited the specialty crop industry (fruit, vegetable, and herb producers) by providing sessions for both conventional and organic production practices and providing opportunities for producers to market their product through retail and/or wholesale outlets. It also provided information to roadside marketers on how to incorporate agritourism activities which will provide a value-added opportunity to their operation. Vendors also benefited from the opportunity to meet with current customers and showcase their products to new customers.

Clearly state the quantitative data that concerns the beneficiaries affected by the project's accomplishments and/or the potential economic impact of the project.

Hard figures for any long-term financial improvement or business growth would be impossible to obtain from the over 600 attendees. The education and benefits they receive by attending this conference would hopefully be utilized for years to come. The fact that a high percentage of our attendees attend yearly and promote the conference to their fellow growers is a testimony that the conference is meeting needs.

Lessons Learned

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

We learned that local food, farmers' markets, organics and niche marketing continue to be extremely popular subject matter, and we were on target in our conference offerings in these areas. We continue to be disappointed in the number of participants who do not take advantage of using this conference to obtain CEU credits. When we first started offering credits a couple of years ago, we thought there would be more interest, but it is not something that seems to be of importance to this group of growers.

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

Even though we have a healthy number of regular attendees, we continue to be surprised by the new and young faces we see each year. There continues to be tremendous growth in the local food and specialty crop industry, and we love to see new faces and the interest in specialty crop production that this conference generates.

In addition, our trade show continues to draw 2/3 of the booths from past and regular vendors, but we continue to be surprised at the number of new vendors we get each year. The word is getting out about our show, and we continue to get new vendors interested in giving it a try.

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

I feel that we satisfactorily met all our goals, and our measurable outcomes were either met or stayed similar to the previous year. The success of the conference continues to be above and beyond in regards to the quality of the educational programming. We get huge compliments on the conference as a whole, but the conference would not be what it is without the superb ability of our program coordinators to foresee what the attendees want to learn year after year.

Contact Person

Diane Handley, Manager of Illinois Specialty Growers Association and Conference Coordinator of the Illinois Specialty Crops, Agritourism, and Organic Conference

Name the Contact Person for the Project, Telephone Number and Email Address

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SC-14-02

2014 Illinois Specialty Crop Grant Final Report

Project Title:

Phase 2: Branding the "Illinois...Where Fresh Is" logo program and calling consumers to action to buy Illinois grown specialty crops.

Project Summary:

"Illinois...Where Fresh Is" is a logo program administered by the Illinois Department of Agriculture. Consumer demand has been increasing for Illinois specialty crops and, as a result, Illinois retailers have expressed interest in sourcing more locally grown products in their stores. However, prior to the adoption of this program there was no comprehensive, statewide promotion effort to help label and advertise these products. The need for proper labeling of Illinois-grown produce has been a priority of the department since the creation of the "Where Fresh Is logo" nearly a decade ago, but the promotional efforts were primarily grassroots and there were few incentives to offer growers.

The "Illinois...Where Fresh Is" logo is utilized by specialty crop growers and retailers throughout the state. CBS Community Partnerships in Chicago, another recipient of Specialty Crop Block Grant funds, has marketed the specialty crop industry in the Chicagoland area through colorful television and online commercials, radio spots and billboards branded with the "Illinois...Where Fresh Is" tagline. Impressed with the success of its multi-media campaign, the Illinois Department of Agriculture saw an opportunity build upon this effort and create a cohesive "Illinois...Where Fresh Is" branding initiative that would benefit specialty crop growers and retailers statewide.

Phase 1 of Branding the "Illinois...Where Fresh Is" logo program and calling consumers to action to buy Illinois grown specialty crops offered promotional kits to Illinois retailers and farmers markets to identify and promote Illinois-grown specialty crops at the point of sale. Retailer stores and individual farmers markets applied for the promotional materials and the Illinois Department of Agriculture worked with each entity on the most effective use of the materials. In addition to the point of sale materials, radio and cable ads were placed outside the Chicago area already represented through CBS Community Partnerships campaign. The ads ran over a six week period from mid-June through July.



They targeted five media markets: Effingham, Mt. Vernon, Carbondale, Marion and Mt. Carmel and had a goal of increasing sales of Illinois-grown specialty crops by at least 15 percent in the 2013 growing season.

Phase 2 of the effort built upon the foundation that was laid in 2013. An additional 75 retailers and 25 farmers markets were offered promotional kits and, for the first time, the program was expanded to include roadside stands. Twenty-five kits were made available for the stands, another potential market for specialty crop growers that has experienced growth in recent years. Roadside stand owners also were provided magnetic bumper stickers sporting the "Illinois...Where Fresh Is" logo to brand their products as they traveled. Because many of these owners transport their produce to stores and typically do not have large display areas, the removable, magnetic stickers allowed them to promote the program in a non-traditional manner. The impact of the media markets that were targeted for ads in 2013 was evaluated as well and a decision was made to add two new regions to the campaign, bringing the total to seven.

In addition to the inclusion of roadside stands, another new component in 2014 was the creation of a "Buy Illinois Fruits and Vegetables Challenge." The challenge is an online pledge that asks consumers to dedicate at least \$10 of their existing weekly grocery budget to the purchase of Illinois-grown specialty crops. If each household in Illinois committed to this goal, the challenge would generate more than \$2.4 billion annually for the Illinois economy. Signage publicizing the challenge, which gives consumers a proactive way to support farmers and their local economy, was included in the Phase 2 promotional kits and also provided to Phase 1 participants.

Project Approach:

The Illinois Department of Agriculture re-enlisted the support of the partners that helped make the 2013 campaign a success, including CBS Community Partnerships, which produced the advertising content to ensure a unified message. CBS created three commercials highlighting specific specialty crops: 1) berries, 2) peaches and watermelon and 3) sweet corn. In addition to the paid outreach efforts, the Illinois Farmers' Market Association, the Illinois Food Retailers Association and the Illinois Farm Bureau assisted on a grassroots level to promote the "Illinois...Where Fresh Is" marketing campaign by disseminating information to their memberships. The department also collaborated with the Illinois Specialty Growers Association, which promoted the logo on its website, and contacted 2013 participants concerning signage for the "Buy Illinois Fruits and Vegetables Challenge."

The challenge was a novel way to keep Phase 1 participants engaged and committed to the "Illinois...Where Fresh Is" project.

Applications for promotional kits were sent to retail stores, farmers markets and roadside stands across the state. Completed applications were first received in March and continued to be submitted through early summer. **Seventy-seven additional kits were distributed, bringing total participation in the campaign since 2013 to 302. The new, 2014 participants included 43 retail stores, 16 farmers markets and 18 roadside stands.** The department kept in close communication with the recipients to alert them to the timing of the media buys. Their feedback proved critical to ensure the ads aired at the same time the targeted specialty crops were available at grocery stores and farmers markets, allowing consumers to respond to the department's "call to action."

The department also reached out to all 2013 participants in regard to the Buy Illinois Fruits and Vegetables Challenge signage available. This also was a good way to keep Phase 1 participants engaged and committed to continuing their support and promotion of Illinois specialty crops.

Goals and Outcomes Achieved:

When drafting its 2014 proposal, the department established the following goals:

- Increase specialty crop sales at designated grocery stores, farmers markets and roadside stands. Surveys, a requirement to receive point-of-sale materials, were conducted at all locations to track sales.
- Increase the number of Where Fresh Is logo applications beyond the designated list of grocery stores and farmers markets to demonstrate the success and recognition of the logo program.
- Increase the number of farmers interested in devoting acreage to specialty crop production in areas where point-of-sale and marketing materials were distributed to meet future specialty crop demand.

These goals were communicated to the department's project partners. After taking into consideration their feedback, information about the initiative was sent to retailers, farmers markets and roadside stands in March. Applications were processed as they were received and the information added to the internal database that was created to track activities. Promotional materials were sent to qualifying retailers, farmers markets and roadside stands.

Most of the kits were distributed simultaneously in bulk. However, some were sent later in the season after additional applications were received. The department kept in close communication with CBS regarding the multi-media ads it was producing. In March, the department contacted the seven, targeted media markets and set a tentative schedule for when these ads would run throughout the growing season. Updates were sent to participants prior to the scheduled air dates to ensure promotional materials were in place and adequate Illinois-grown specialty crops were available for consumer purchase. Participants shared photos and success stories as well as information about any difficulties they were experiencing. The television and radio ads promoting berries, peaches, watermelon and sweet corn were broadcast over a six week period from mid-June through July. Participating retailers, farmers markets and roadside stands kept their point-of-sale materials on display through the entire growing season to promote additional Illinois-grown specialty crops that were not featured specifically in the paid ads.

In October, a survey was distributed to participants. Questions regarding sales of specialty crops and the effectiveness of the branding campaign were asked. Participants reported increases in specialty crop sales ranging from 5-to-50 percent, and retailers indicated they had increased the amount of Illinois specialty crops on their store shelves. **An increase also was recorded in the number of "Where Fresh Is" logo applications. The department received an additional 20 applications during the year, bringing total participation in the program to 306. While the seven percent annual increase in 2014 was below the goal of 10 percent, during its first two years the branding initiative saw participation grow almost 30 percent, exceeding expectations of a 20 percent gain for the timeframe.**

Beneficiaries

The entities that benefited from the "Illinois...Where Fresh Is" branding initiative were Illinois retailers, farmers markets, roadside farm stands, consumers and specialty crop growers. **One-hundred-ninety-three retailers, 91 farmers markets and 18 roadside stands** benefited greatly from the free promotional materials, the subsequent advertising, the additional promotional efforts and support of the Illinois Department of Agriculture, increased consumer satisfaction and increased sale of specialty crops. Consumers benefited from the educational information about Illinois specialty crops in the media ads. In addition, the "Where Fresh Is" logo made it easier for them to identify Illinois-grown specialty crops while shopping and its increased use ensured more outlets carried the products. Lastly, the specialty crop industry as a whole benefited because there were additional markets for farmers to sell through, which increased demand for their products.

Lessons Learned

A variety of lessons were learned in 2013, many of which helped the department to plan more adequately for 2014. For example, as a result of the feedback received from retailers and farmers markets, changes were made to the signage offered in the promotional kits. A retractable, vertical banner was provided to retailers that was easier to assemble and took up less floor space. Farmers markets and roadside stands were provided weather-proof, sail banners that were more appropriate for the outdoors. Market managers and stand owners reported these banners withstood wind and rain much better than those supplied in 2013.

Retailers, predictably, were very receptive to the branding promotion. They now recognize the importance of sourcing local produce, but need help making connections with farmers. The department introduced interested retailers to the Illinois Farm Bureau so they could become involved in its Meet the Buyer events and begin establishing those relationships.

Expanding the reach of the campaign to additional farmers markets and roadside stands during Phase 2 was more difficult than anticipated. Because farmers markets are easily started and not required to register with the state, there is no reliable way of obtaining contact information for new markets. The department and Illinois Farmers Market Association (IFMA) both attempt outreach to new and even existing markets, but these efforts still are not able to identify all of the markets in Illinois. Compounding the difficulty is that many markets do not have an e-mail address, which is the department's primary method of communication. The outreach in 2013 seems to have captured the markets that actively participate in various IDOA- and IFMA-sponsored initiatives. Securing the participation in 2014 of those markets that are not as active proved difficult. The recruitment of additional retailers experienced a similar problem, resulting in lower participation numbers than projected.

The project's third goal was to foster an environment where farmers would see a need to increase their yield to meet demand. The department discovered, though, that the bond between farmers and the markets they serve is exclusive and it does not have the ability to reach each of these farmers to determine whether they intend to increase production.

Contact Information

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Project Title:

SC-14-04

“Illinois.....Where Fresh Is”

a State wide, multi media advertising campaign including television, digital and outdoor



Project Summary:

- According to a 2010 Illinois Specialty Crop Survey, more than 101,000 acres of Illinois farmland are devoted to growing specialty crops which produced nearly \$392 Million in annual sales for Illinois farmers. Since such a significant amount of land is focused on these crops, we have a distinct need to increase demand on them and grow industry sales at the same time. “Expanding access to nutritious, homegrown Illinois food is one of my top priorities” Agriculture Director Bob Flider said. The “Illinois Where Fresh Is” campaign is in direct support of this objective.
- The “Illinois Where Fresh Is” campaign is important because it educated and encouraged consumers to buy locally produced Specialty Crops, thereby changing their purchasing habits. This behavior change resulted in keeping monies in the State and enhancing the competitiveness of Specialty Crops.



Project Summary:

- This project is important because increased education and outreach about Specialty Crops which stimulated better nutritional choices and increased the purchase of Illinois grown Specialty Crops
- The project was timely, it ran in the spring and summer when the Specialty Crops we featured were at their peak.
- The project complimented our previous campaigns which ran in 2010, 2012 and 2013 by building on the core foundation of consumers already familiar with the initiative (and reminded them to continue to support Specialty Crops) and grew awareness among new consumers.



Project Approach:

- The CBS Community Partnership Division executed a multi media education and outreach campaign utilizing television, digital, outdoor and on site components. All creative elements and production, for all media, including creative concept, talent, (i.e. voiceovers, actors, editing, post production, music & graphics) was contributed in kind by the CBS Community Partnership Division.
- The CBS Community Partnership Division worked together with the IDOA to craft messages that promoted the Specialty Crop program and educated consumers on why they should buy local when grocery shopping. This resulted in a positive effect on the economy by keeping dollars in the State. The messages also encouraged people to visit www.illinoiswhereresis.com for more information.
- Collaborating with the IDOA we created a pre and post campaign survey to assess peoples knowledge of Specialty Crops.



Project Approach:

- The grant agreement required the below elements which have been delivered:
 - Production of 2x :30 television vignettes
 - Production of 1x :05 television vignette
 - Production of 1x :15 television vignette
 - All digital production including skins, pencil push down, pre roll and banners
 - Outdoor production and installation of 7 billboards
 - Research to target program environments and outdoor locations that deliver the target consumer including both paid for and in kind inventory
 - Pre/ Post campaign survey
 - Placement of all media schedules
 - Monitoring of all campaigns to ensure deliverables
 - Materials distribution
- In kind the CBS community Partnership Division produced customized and cohesive creative for all media which explained the importance of choosing Specialty Crops and the benefits of healthy eating habits. CBS 2 – TV, cbschicago.com (the combined web sites of CBS 2 (WBBM) TV, the SCORE (WSCR) radio station and WBBM Newsradio 780/ 105.9) and CBS outdoor collaborated to share important messages regarding Specialty Crops.

Goals and Outcomes Achieved- broadcast:

- The television production component of our agreement included:

Agreement

- 2x :30 vignettes
- 1x :15 vignettes
- 1x :05 ID

Results

- 2x :30 vignettes
- 1x :15 vignettes
- 1x :05 ID

- The television on air component of our agreement guaranteed:

Agreement

- 18,149,000* Adult 18+ impressions

Results

- 19,184,000* Adult 18+ impressions

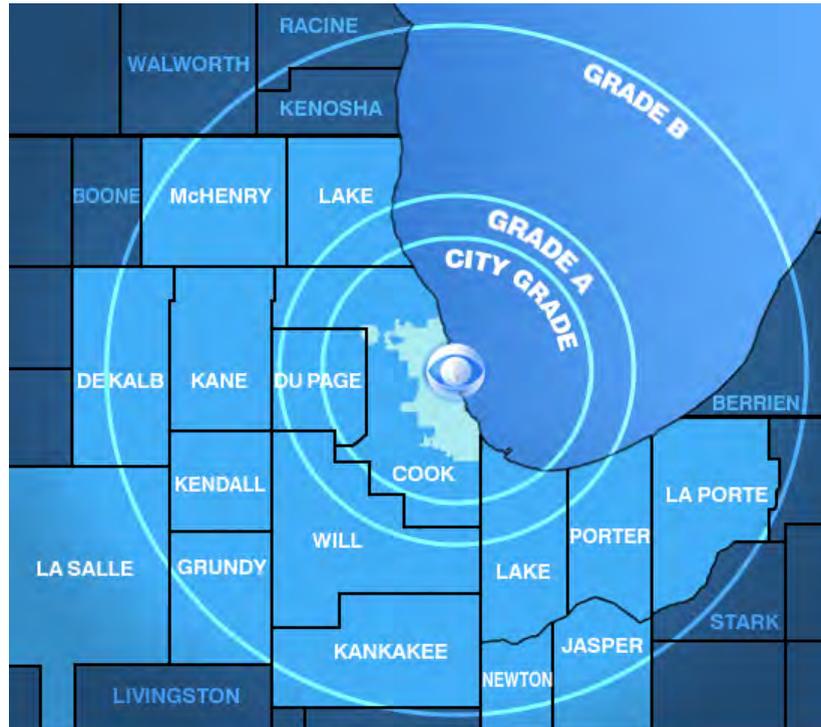
- *Television impressions delivered at 106%!*

- Highlights of the campaign include prime exposure in Person of Interest, Criminal Minds, 48 Hours and the Under the Dome Premier!

*deliveries based on Nielsen ratings- impression = total number of times viewed (not unduplicated viewing)

Goals and Outcomes Achieved:

- The advertisements aired across the 16 county Chicago “designated market area” on CBS 2 television



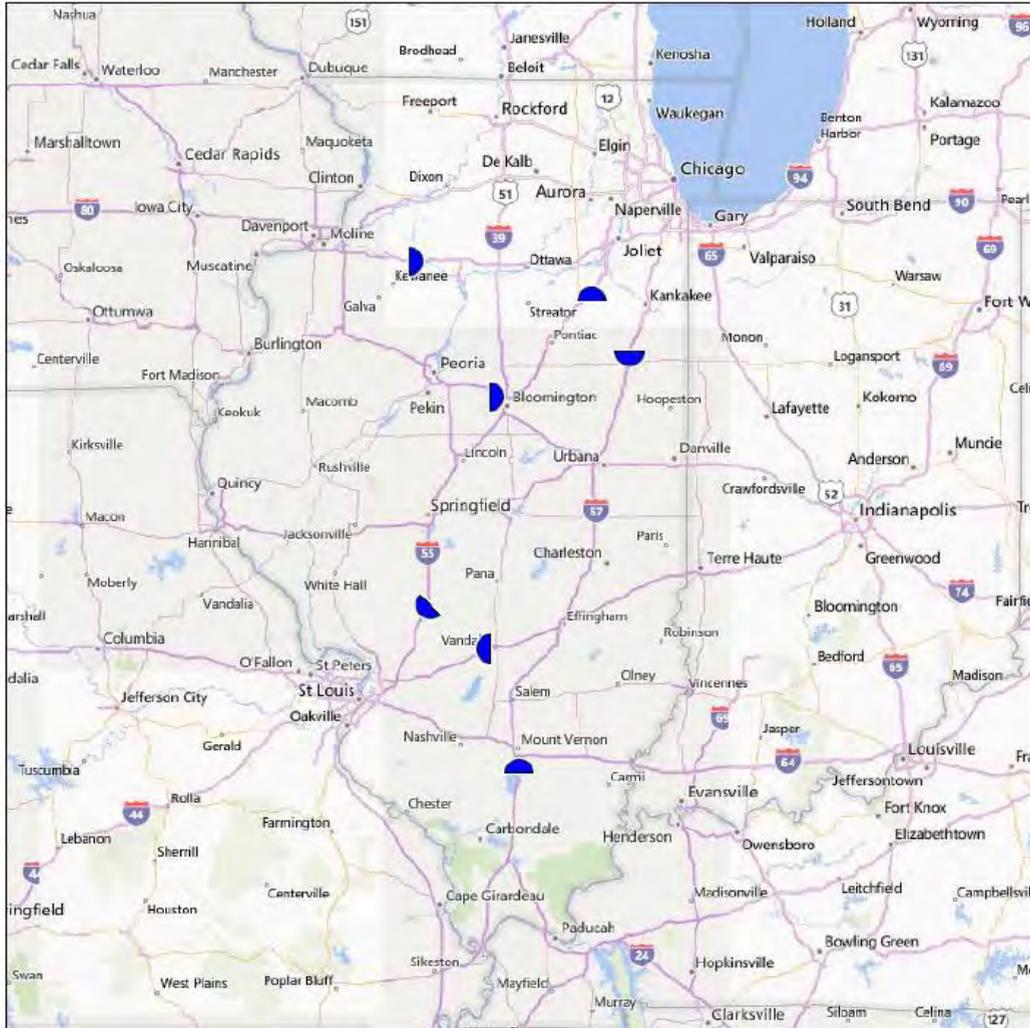
CITY OF CHICAGO	
DMA	
STATION TOTAL	

Goals and Outcomes Achieved- Outdoor:

- The outdoor component of our agreement included 7 billboards posted from 5/26-6/22/14. We selected seven outdoor locations to coincide with the 5 zones the IDOA targeted with their cable campaign. The boards were located close to : Kewanee, Streator, Bloomington, Vanda, Mount Vernon and outside of Kankakee and Springfield. We guaranteed 1,500,000 adults 18+ impressions (including duplication) and delivered 1,574,500 impressions! As of 11/21/14 5 of the 7 boards are still up at no cost! We value your partnership.

Face #	Description	Posting Market	Scheduled Dates	Scheduled Days	Showing Days	Override Days	Purchase Type	Area	Media	Ill.	F	OOH Rating
000875B-O	I-55 5.5 mi S/O Hwy 108 W/S	Mid West Non-Metro	5/26/2014 - 6/22/2014	28	158	130	Regular	Montgomery County, IL	Bulletins	Y	NE	110,270
	Design	Posted Date	Covered Date									
	IL DEPT OF AG	6/16/2014										
008159A-O	I-57 2.9 mi N/O 24 W/S	Mid West Non-Metro	5/26/2014 - 6/22/2014	28	38	10	Regular	Iroquois, IL	Bulletins	Y	N	35,043
	Design	Posted Date	Covered Date									
	IL DEPT OF AG	5/24/2014	7/1/2014									
009475A-O	S/S I-80 4 mi W/O State Road 40	Mid West Non-Metro	5/26/2014 - 6/22/2014	28	177	149	Regular	Bureau, IL	Bulletins	Y	W	22,524
	Design	Posted Date	Covered Date									
	IL DEPT OF AG	5/28/2014										
009490A-O	I-74 3.5 mi W/O I-55 Jct S/S	Mid West Non-Metro	5/26/2014 - 6/22/2014	28	90	62	Regular	McLean, IL	Bulletins	Y	W	53,504
	Design	Posted Date	Covered Date									
	IL DEPT OF AG	5/24/2014	8/22/2014									
009637A-O	I-57 7.5 mi N/O Hwy 154 E/S	Mid West Non-Metro	5/26/2014 - 6/22/2014	28	177	149	Regular	Jefferson County, IL	Bulletins	Y	S	65,357
	Design	Posted Date	Covered Date									
	IL DEPT OF AG	5/28/2014										
014615W-O	E/S I-55 .8 mi S/O Gardner	Mid West Non-Metro	5/26/2014 - 6/22/2014	28	177	149	Regular	Grundy, IL	Bulletins	Y	S	50,967
	Design	Posted Date	Covered Date									
	IL DEPT OF AG	5/28/2014										
030582A-O	I-70 3.1mi W/O Hwy 40 (Exit #61) N/S	Mid West Non-Metro	5/26/2014 - 6/22/2014	28	178	150	Regular	Fayette County, IL	Bulletins	Y	E	55,960
	Design	Posted Date	Covered Date									
	IL DEPT OF AG	5/27/2014										

Goals and Outcomes Achieved 2014:



Outdoor:

Face # 000875B-0 - I-55 5.5 mi S/O Hwy 108 W/S



Photo taken on: 6/17/2014



Photo taken on: 6/17/2014

Face Information

Media:	Bulletins	Posted Date:	6/16/2014	Design:	IL DEPT OF AG
Area:	Montgomery County, IL	Covered Date:		First Received On:	n/a
Posting Market:	Mid West Non-Metro	Showing:	49	Last Received On:	n/a
Direction:	NE				
Illumination:	18 hours				
DEC (000's):	17				
OOH Rating:	97,971				
Reason Late:	Posting copy not received by CBS Outdoor on time.				



Outdoor:

Face # 008159A-0 - I-57 2.9 mi N/O 24 W/S



Photo taken on: 5/26/2014



Photo taken on: 5/26/2014

Face Information

Media:	Bulletins	Posted Date:	5/24/2014	Design:	IL DEPT OF AG
Area:	Iroquois, IL	Covered Date:	7/1/2014	First Received On:	n/a
Posting Market:	Mid West Non-Metro	Showing:	38	Last Received On:	n/a
Direction:	N				
Illumination:	12 hours				
DEC (000's):	8				
OOH Rating:	34,705				



Outdoor:

Face # 009475A-0 - S/S I-80 4 mi W/O State Road 40



Photo taken on: 5/29/2014



Photo taken on: 5/29/2014

Face Information

Media:	Bulletins	Posted Date:	5/28/2014	Design:	IL DEPT OF AG
Area:	Bureau, II	Covered Date:		First Received On:	n/a
Posting Market:	Mid West Non-Metro	Showing:	68	Last Received On:	n/a
Direction:	W				
Illumination:	12 hours				
DEC (000's):	8				
OOH Rating:	16,889				



Outdoor:

Face # 009490A-0 - I-74 3.5 mi W/O I-55 Jct S/S



Photo taken on: 5/26/2014



Photo taken on: 5/26/2014

Face Information

Media:	Bulletins	Posted Date:	5/24/2014	Design:	IL DEPT OF AG
Area:	Mclean, IL	Covered Date:		First Received On:	n/a
Posting Market:	Mid West Non-Metro	Showing:	72	Last Received On:	n/a
Direction:	W				
Illumination:	12 hours				
DEC (000's):	12				
OOH Rating:	52,124				



Outdoor:

Face # 009637A-0 - I-57 7.5 mi N/O Hwy 154 E/S



Photo taken on: 5/29/2014

Face Information

Media:	Bulletins	Posted Date:	5/28/2014	Design:	IL DEPT OF AG
Area:	Jefferson County, IL	Covered Date:		First Received On:	n/a
Posting Market:	Mid West Non-Metro	Showing:	68	Last Received On:	n/a
Direction:	S				
Illumination:	12 hours				
DEC (000's):	15				
OOH Rating:	65,522				



Outdoor:

Face # 014615W-0 - E/S I-55 .8 mi S/O Gardner



Photo taken on: 5/29/2014

Face Information

Media:	Bulletins	Posted Date:	5/28/2014	Design:	IL DEPT OF AG
Area:	Grundy, IL	Covered Date:		First Received On:	n/a
Posting Market:	Mid West Non-Metro	Showing:	68	Last Received On:	n/a
Direction:	S				
Illumination:	12 hours				
DEC (000's):	12				
OOH Rating:	33,935				



Outdoor:



Goals and Outcomes Achieved-Digital:

- The agreed upon digital campaign guaranteed 308,000 impressions CBSchicago.com delivered 2,191,063 impressions! We provided additional “in kind” inventory. Following please find itemized deliveries:

Campaign Ad Units

- 300x250 medium rectangle
- 728x90 leaderboard
- 2x2 video pre-roll
- Background Skin & Pencil Pushdown

Delivery Report:

Total Impressions delivered: 2,191,063

Total Clicks: 3,983

Average CTR: 0.18 %

CTR by ad unit:

- pre-roll avg CTR 2.16% - .25%
- pencil pushdown CTR .36%
- background skin CTR .59% - 1.31%
- display banners 0.01% – 0.03%

Pre/ Post Survey Analysis:

	May 2014	July 2014	% Increase
Total number of people surveyed	296	300	+1%
Total number of people who recognized the logo of those that were surveyed	163 (55%)	172 (57%)	+6%
Total of those that recognized the logo on TV	87	95	+9%
Number of people who saw Illinois Where Fresh Is logo on an Outdoor Billboard	4	8	+100%
Number of people who prefer local specialty crops because it supports farmers/local economy and increases jobs	49	82	+67%
Deciding factors in purchasing specialty crops	1. Appearance (79)	1. Appearance (144)	+82%
	2. Price (53)	2. Price (94)	+77%
	3. Locally Grown (41)	3. Locally Grown (130)	+217%
	4 Organic (25)	4. Organic (83)	+232%

Key Takeaways:

- People who prefer specialty crops jumped by 67% as a result of our outreach and education campaign.
- A significant post campaign change was the 217% increase in consumers who indicated “locally grown” as a determining factor in purchase!



Beneficiaries :

- The beneficiaries of the project are Illinois residents, Specialty Crop farmers and the Illinois General Economy
- Viewers, beneficiaries touched by outreach detailed by medium:
 - 19,184,000 duplicated adults 18+ via television; according to Nielsen
 - 2,191,063 impressions on cbschicago.com
 - 1,574,500 Adults 18+ impressions via outdoor (includes duplication)
 - 22,949,563 Total impressions delivered
- In fulfillment of the grant the CBS Community Partnership Division guaranteed 20,053,724 impressions, we over delivered by 2,895,839 or 14%!



Beneficiaries :

- The beneficiaries are impacted by the campaign to purchase Illinois grown Specialty Crops which keeps money in the State and supports the Specialty Crop Industry
 - If just 3% of the TV campaign's impressions alone (575,520), translate to first time buyers of specialty crops that shifted \$5 per week of their current grocery budget to the Specialty Crop Industry, the State would realize over \$2.8M of incremental dollars! That's over \$2.8 Million dollars circulating in the Illinois economy.
 - The impact and dollars are increased through the extended reach delivered by the additional media outlets (digital and outdoor)
- In addition beneficiaries were educated about the nutritional advantages of Specialty Crops
- A healthier population results in a healthier State economy
- Based on the USDA-NASS-Illinois Field Office 2010 Specialty Crops Survey: one acre of Specialty Crop Production generates \$3,884 in sales for a farmer. If our education and outreach effort increases sales by only 1% per acre (\$3,922) that's a 3.8M gain to Illinois Specialty Crop Farmers based on the Illinois acreage of 101,058.

Lessons Learned :

- 1) From previous campaigns we recognized we needed to revise the outdoor creative to maximize it's impact and retention for people driving cars at 60 or 70 MPH
- 2) For the first time we aligned each vignette, which focused on a specific Specialty Crop, with the month/ week when the crop was at it's peak. This strategy enforced the call to action when the crop was most plentiful.
- 3) The Chicago market experienced severe weather storms on 6/30 and 7/1 hence Nielsen ratings were not published which resulted in an under reporting of our television impressions.
- 4) Rainfall delayed the installation of one of the outdoor billboards, to remedy this we extended the time the board was in place.



Additional Information:

2014 Illinois Specialty Crop Grant Program

Budget Information

Expenditure	Category	Invoice Number	Amount on Invoice Charged Against Grant	Amount of Matching Funds	Amount of In-Kind Contributions	Total
Television vignette production 2x :30					\$ 30,000.00	\$ 30,000.00
Television vignette production 1x :05 ID					\$ 3,500.00	\$ 3,500.00
Television vignette production 1x :15					\$ 10,000.00	\$ 10,000.00
Internet production					\$ 500.00	\$ 500.00
Outdoor production/ installation					\$ 3,500.00	\$ 3,500.00
7 CBS Outdoor Billboards- Mkts TBD			\$ 10,000.00			\$ 10,000.00
CBSChicago.com- 308,000 guaranteed impressions			\$ 14,400.00			\$ 14,400.00
CBS 2 TV (146x :30/ 12x :15/ 38x :05) to run in CBS Primetime, News etc.			\$ 100,100.00		\$ 13,750.00	\$ 113,850.00
Media buying/ execution					\$ 15,000.00	\$ 15,000.00
Materials Distribution					\$ 1,000.00	\$ 1,000.00
						\$ -
						\$ -
						\$ -
TOTAL			\$ 124,500.00	\$ -	\$ 77,250.00	\$ 201,750.00

Contact Person:

- Sharon Buchanan sbbuchanan@cbs.com 312-899-2711 22 W. Washington, Chicago Il. 60201

Project Title: Strawberries from "tower to table": maximizing productivity of high tunnel space with stacked hydroponic pots

Partner Organization: University of Illinois at Urbana – Champaign

Project Summary: Demand for local food in Illinois is growing, but current production of many specialty crop commodities in Illinois is insufficient to meet this demand. Strawberry is a potentially profitable specialty crop that can be grown successfully in Illinois, but production is currently limited to less than 400 acres. Preliminary trials at the University of Illinois suggest that vertical, hydroponic production of day-neutral strawberries in high tunnels can be profitable, providing gross economic returns of approximately \$15,000 per year in a 30 x 96 ft. high tunnel. Vertical strawberry production maximizes productivity per unit area in high tunnels, limits weed and soil-borne pests, and facilitates easier harvesting. The goal for this project is to determine the optimum strawberry varieties and planting dates for the vertical production of hydroponic strawberries in high tunnels in southern and central Illinois. In addition, we aim to demonstrate the feasibility of this system with the long-term goal of increasing the production and supply of fresh market strawberries in Illinois.

Project Approach: A high-tunnel was constructed at the Dixon Springs Agricultural Center (DSAC) and a Verti-Gro system was constructed at the Crop Sciences Research and Education Center (CSREC) in 2014 to accomplish project objectives. A Verti-Gro system was already present at DSAC and a high-tunnel was already present at CSREC for project use. A preliminary study was conducted in 2014 at CSREC using strawberry, basil, and cilantro specialty crops to determine the optimum nutrient solutions for the Verti-Gro system. Formal trials began in fall 2014 to identify the best cultivars, growing media, and nutrient solutions for vertical, hydroponic strawberry production in Illinois. The fall planting succumbed to gray mold and anthracnose at

CSREC and frost damage in spring 2015 at DSAC, so both locations were replanted in spring 2015. Data was collected throughout the growing season for water chemistry, leaf chlorophyll content, fruit yield and quality. Strawberries were harvested through September and all data were analyzed.

Strawberry yield was greatest when grown in perlite mixed with coco coir or vermiculite and fertilized with a synthetic nutrient source. Yield was reduced by up to 15% when fertilized with a bio-based, liquid nutrient source and vermicompost mixed with soilless media. Strawberry yield among cultivars varied by year and location, but Florida Radiance, Monterey, Evie 2, Portola, and Seascape were among the highest-yielding cultivars in at least one site-year. Results contribute to the development of best management practices for vertical, hydroponic, high tunnel strawberry production in the midwestern U.S., but further research is needed to understand nutrient dynamics and crop physiological response among levels within vertical, hydroponic towers.

The potential gross economic returns observed in this study ranged from \$6,400 to \$16,000 per 30 x 96 ft high tunnel depending on cultivar, growing media, nutrient source, and location. The most profitable system was likely 'Florida Radiance' grown in a coco coir + perlite mix with synthetic fertilizer in Southern Illinois. The least profitable system was likely 'Chandler' grown in perlite with a combination of liquid and solid organic nutrients. It is important to note that hydroponic systems and high tunnels require significant capital investment (relative to open field, soil-based production), and growers should carefully consider their potential return on investment before adoption. As an example, a typical 30 × 96 ft high tunnel currently costs >\$7,000 and a vertical hydroponic system to fill that space costs >\$6,500. This total initial investment (>\$13,500), and the depreciation of the equipment over time, are

potentially significant barriers to the adoption of this system; thus, future studies should focus on possible management scenarios for improving profitability and return on investment.

Goals and Outcomes Achieved: Our research goal was to determine the best cultivars, media, and nutrient sources for vertical, hydroponic strawberry production in high tunnels for Illinois farmers. Preliminary data (benchmark) suggested that strawberry cultivars ‘Monterrey’ and ‘Florida Radiance’ can be grown successfully in vertical, hydroponic, high tunnel production systems of southern Illinois. The information we targeted included the determination of the highest-yielding varieties and ideal nutrient source for this production system in central Illinois, the best type of growing media, and the potential profitability of this production system in central and southern Illinois. This information was successfully determined (measured) according to the approach and results outlined above.

Our outreach goal was to increase knowledge of best management practices for vertical, hydroponic, high tunnel strawberry production among Illinois specialty crop growers so they might be able to optimize strawberry yield and economic potential of valuable high tunnel space. To our knowledge, (benchmark) no growers in Illinois were producing vertical, hydroponic strawberries for commercial sale. However, in 2012 over 300 growers were educated about our preliminary trials at conferences or programs and 400 growers toured the production system at five field days in Dixon Springs. Our initial target was that by May 2016, an additional 400 growers will have received production and economic information about this system in Illinois. We accomplished this goal and delivered information about this system to: 150 growers at two field days at DSAC in 2014 and 2015; 30 growers at a hydroponics workshops in 2015 at St. Charles, IL; 50 growers at the 2014 and 2015 Kankakee Fruit and Vegetable Growers Symposiums; 30 growers attending the Illinois Small Farms Winter Webinar in 2015 (webinar is

archived online and has likely impacted more growers than the 30 in live attendance); 150 growers during three different presentations at the 2015 and 2016 Illinois Specialty Crops, Agritourism, and Organic Conferences; 50 undergraduate and graduate students enrolled in “Urban Food Production” (HORT 435) at the University of Illinois; and 25 high school students in the 4-H Illini Summer Academies program (at least 485 total people impacted).

Beneficiaries: The main beneficiaries of the project were specialty crop growers in Illinois with existing high-tunnel infrastructure. Many of these beneficiaries were in attendance at field days (150 growers impacted), and workshops, webinars, and conference presentations (260 growers impacted). Secondary beneficiaries were students at the University of Illinois who learned about vertical strawberry production via YouTube videos from this project (<https://www.youtube.com/watch?v=H4ZPs6J8Yio>; 50 students impacted) and high school students who attended a field day (25 students impacted). Countless specialty crop educators and researchers also benefited from the project through our presentation at specialty crop conferences and our recently published research paper in HortTechnology (Wortman et al., 2016; see below).

Lessons Learned: In addition to the scientific conclusions outlined in the sections above, we learned several practical lessons from this project. First, we learned that this vertical, production system is only feasible in a full-size 30 x 96 ft high-tunnel. The tunnel used for the experiment at CSREC was a “caterpillar” tunnel and not as large as the tunnel at DSAC. The smaller tunnel resulted in more volatile temperature swings (extreme heat and cold) that led to severe physiological stress and even plant mortality. We also learned that bare-rooted strawberry plants should be potted immediately after receipt from the supplier. In our experience, prolonged cold storage at 38°F led to severe botrytis and/or anthracnose. Lastly, we learned that over-wintering strawberry plants in vertical production systems of central Illinois is likely not practical cost-

effective. Strawberries are cold-tolerant to approximately 20 °F and it was difficult (sometimes impossible) and labor-intensive to maintain adequate temperatures in the greenhouse to keep plants alive. However, we did successfully begin production in late-February with bare-rooted plants, which is approximately two months earlier than could have been achieved in an open field production system.

Contact Person:

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https://twitter.com/UNL_EnvrHort

Publications:

Wortman, S. E., M. S. Douglass, and J. Kindhart. 2016. Cultivar, growing media, and fertilizer source influence strawberry yield in a vertical, hydroponic, high tunnel system. HortTechnology.

In press.



SC-14-06

NAME OF APPLICANT

The Land Connection

PROJECT TITLE

Provide the project's title.

Equipping Illinois Specialty Crop Farmers with Marketing Framework and Social Media Tools

PROJECT SUMMARY

Provide a background for the initial purpose of the project, which includes the specific issue, problem, or need that was addressed by this project. Describe the importance and timeliness of the project. If the project was built on a previously funded project with SCBGP or SCBGP-FB describe how this project complemented and enhanced previously completed work.

To meet the increasing consumer demand for fresh, local produce, more Illinois farmers are growing and direct-marketing specialty crops. While most are excellent growers, few have marketing plans. Still fewer have detailed knowledge of, or use, online marketing tools such as Facebook, Twitter, Pinterest, Google+, and Tumblr. These and other emerging social media tools have become an inexpensive and accessible way to promote local produce directly to the consumer, increase sales, and enhance the competitiveness of Illinois specialty crops. Specialty crop growers are particularly well-suited to use social media tools, not only to market their products, but to connect with consumers by telling the story of their farm and family through compelling posts. The specific issue addressed by this project was Illinois specialty crop farmers' lack of comprehensive marketing plans, and lack of familiarity and comfort using powerful social media marketing tools. The purpose of this project was to equip Illinois specialty crop farmers with workshops, fact-sheets, and free starter content and helped them gain knowledge, familiarity, and experience using social media tools, and developing customized and comprehensive marketing plans to promote their agricultural operations and enhance the competitiveness of Illinois specialty crops. This project was particularly timely because it tapped into the growing use of social media by consumers, chefs, institutional buyers, farmers' market managers, local food advocates, educators, and others. The project's overall goal was to increase specialty crop farmers' viability by providing them with effective marketing tools and skills.

This project complements and built upon our previous SCBGP-FB funded project, SC-13-06, entitled Maximizing Awareness, Purchase, and Use of Illinois Specialty Crops through Infographic, Weekly Columns, Viral Content, and Social Media Strategies. In this project, The Land Connection used social media outreach tools to virally amplify our message about the broad availability, and excellence, of Illinois specialty crops to reach a wide audience of producers and consumers. The current project builds upon SC-13-06 by responding to a farmer-identified need for marketing assistance, particularly using social media tools. In addition, the current project builds on the knowledge gained, and relationships established via the previously funded project. As a result, this project is even more collaborative and broad-based, involving 13 organizations from across the state that will further extend the impact of the project.

PROJECT APPROACH

Briefly summarize activities and tasks performed during the entire grant period. Whenever possible, describe the work accomplished in both quantitative and qualitative terms. Specifically, discuss the tasks provided in the work plan of the approved project proposal. Include favorable or unusual developments. Present the significant contributions and role of project partners in the project.

We began in January 2014 by meeting with our project partners at Second Cup Media to create a strategic plan. We established a schedule for monthly meetings via Google Hangout that enabled us to keep up with each other's progress on their assigned deliverables. We also set dates and chose locations for our workshops, which were held in March. Our partners at Second Cup Media also chose the social media platforms that we highlighted in the workshops and in the Social Media Starter Kits. In February, we finalized the dates and locations for the social media workshops, started publicity via social media and our partners, created a pre-class survey, and began creating the social media starter kits. Our project partners completed the seven (two more than planned) social media fact sheets, and began working on the curriculum for the workshops.

In March, we finalized the workshop curriculum, upload the fact sheets to the TLC website, and used them to promote the social media workshops. The TLC staff finished the pre-class surveys and sent them to attendees when they registered for the class. Second Cup Media presented the workshops, on March 18 (Rockford, IL) and March 20 (Springfield, IL), which were attended by TLC staff. We did have one readjustment to the project at this point. With many farmers requesting us to come to other locations nearer to them, and even more asking if it would be taped and available online after, we made the hard decision to cancel the Carbondale workshop and divert our energy toward creating a six part webinar. By April, Second Cup Media was prepared to record the final social media workshop as a webinar. These were recorded and are available both on The Land Connection's website and YouTube channel. Our staff also continued to work on the social media starter kits.

Over the next five months, TLC staff worked on this project. In May, we continued to monitor how the social media fact sheets and YouTube videos were being viewed and promoted them on social media. We also finished the content for the first social media starter kit, sending the first one out to farmers who signed up to receive it. June was similar, with more emphasis on attracting additional signups by July. In August, we incorporated more of the information from the fact sheets into the starter kits, hoping to encourage more viewers to explore the site further. We also created a list of posts indexed by vegetable, rather than by platform and month. At the end of October, we sent out our first post-season survey. Several farmers responded immediately, and their feedback was helpful and reinforced many

of the ideas we had about our progress. We had an open rate of 42% for emails about the postseason survey, consistent with the overall open rate for emails sent in relation to this project, only 5% responded.

Half the post-season surveys were completed by farmers who had attended a workshop. From these, and our examination of the real and reported social media use between the 2013 and 2014 seasons, it appears that the starter kits and the workshops had about equal impact on those who had a social media presence. Individual farms who were already using social media in some form began using more platforms. Overall, most farms seemed to post slightly more frequently than in past years. When we could access the personal pages of farmers, as well as their farm accounts, those who were more active social media users personally also had more active farm accounts.

More specifically:

In January, the TLC executive director created a project space on our project management cloud, Smartsheet, for all participants to use, created a strategic plan, and worked on outreach materials. Kristi Waits, from Second Cup Media, created a class agenda and chose the social media platforms that we will focus on. Magdalena Casper-Shipp hired a social media intern, worked on outreach materials, and created pages on the TLC website to promote the workshops and social media starter kits and allow people to sign up for the workshops.

In February, the TLC executive director created brainstorming documents for the content of the social media starter kits and met with all project participants in order to keep on task. Kristi Waits Second Cup Media created seven social media fact sheets and began work on the curriculum. Magdalena Casper-Shipp scheduled all of the workshops, monitored the sign-ups through the website, created outreach materials and worked with our social media intern, Akshita, to get the word out via social media.

In March, the TLC executive director continued to work on the social media starter kits and met with all project participants in order to keep on task. Kristi Waits Second Cup Media presented the two social media workshops in Rockford, IL and in Springfield, IL. Magdalena Casper-Shipp did all of the logistics for the workshops, attended the workshops, monitored the sign-ups through the website, created outreach materials and worked with our social media intern, Akshita, to get the word out via social media.

In April, the TLC executive director continued to work on the social media starter kits and met with all project participants in order to keep on task. Kristi Waits Second Cup Media presented the six one-hour social media webinars and recorded them to YouTube. Magdalena Casper-Shipp assisted with the webinars, monitored the analytics through the website, created outreach materials and worked with our social media intern, Akshita, to get the word out via social media.

In May, the TLC executive director continued to work on the social media starter kits and met with all project participants. Magdalena Casper-Shipp assisted with the monitored the analytics through the website, created outreach materials and worked with our social media intern, Akshita, to get the word out via social media. Magdalena and Akshita also compiled and formatted the social media starter kits and sent out the first one.

In June, the TLC executive director continued to work on the social media starter kits and met with all project participants. Magdalena Casper-Shipp assisted with the monitored the analytics through the website, created outreach materials and worked with our social media intern, Akshita, to get the word out via social media. Magdalena and Akshita also compiled and formatted the social media starter kits and sent out the first one.

In July, the TLC executive director continued to work on the social media starter kits and met with all project participants. Magdalena Casper-Shipp monitored the analytics through the website, created significant outreach materials and worked with our social media intern, to get the word out via social media. Magdalena also compiled and formatted the social media starter kits, researching additional material for July and beyond and sent out the second one.

In August, the TLC executive director continued to work on the social media starter kits and met with all project participants. Magdalena Casper-Shipp monitored the analytics through the website, created significant outreach materials and worked with our social media intern, to get the word out via social media. While we made fewer posts in July than preceding months advertising the kits, the posts we did make were popular, with one Facebook post receiving 1800 views, 20 likes and 3 shares, making it one of our better performing posts overall for the month of July. Because this post was about HOW to market, rather than sample content, we decided that viewers were interesting in learning the “nuts and bolts” of social media marketing, but that the farmers we are targeting may be feeling overwhelmed at this point in the season, leading to our increased emphasis on “how to” for August. Magdalena also compiled and formatted the social media starter kits, did some research for later months and created an index of posts by vegetable and topic.

In September, the TLC executive director continued to work on the social media starter kits and met with all project participants. Magdalena Casper-Shipp monitored the analytics on the grant materials both on the website and with our own social media promotion of the materials. Magdalena interviewed several farmers, both who took the Social Media Marketing workshop and who did not, about why they were or were not accessing the site. Overwhelmingly, the farmers reported that they have plans to post things, or take photos from the field, but forget or do not have time during harvest days, and so end up not being able to meet their own social media expectations. Magdalena also started working on a way of tracking how farmers who attended the workshop and received the kits have changed their social media usage as compared to last year.

In October, the TLC executive director continued to work on the social media starter kits and met with all project participants. Magdalena Casper-Shipp monitored the analytics on the grant materials both on the website and with our own social media promotion of the materials, including sending out a survey to the farmers who received the kits. Initial results showed that half of the early responders used the kits about once a month and for ideas, which corroborates with the spike in visits to the site early in the month, followed by gradual tapering.

In November, the TLC executive director continued to work on the project and met with all project participants. Magdalena Casper-Shipp monitored the analytics on the grant materials both on the website and with our own social media promotion of the materials. She sent follow-up reminders for the end of season survey, but did not get many more responses. Magdalena also compared the social media use of farm accounts between the 2013 and 2014 seasons, and when possible, also looked at the farmers’ personal use. This primarily was to get a sense of how comfortable they were with the tools, and as mentioned above, more active users tended to be more active in both their personal and farm personas.

GOALS AND OUTCOMES ACHIEVED

Describe the activities that were completed in order to achieve the performance goals and measurable outcomes identified in the approved project proposal or subsequent amendments. If outcome measures were long term, summarize the progress that has been made towards achievement. Provide a comparison of actual accomplishments with the goals established for the reporting period. Clearly convey completion of achieving outcomes by illustrating baseline data that has been gathered to date and showing the progress toward achieving set targets. Highlight the major successful outcomes of the project in quantifiable terms.

Overall, this project increased the ability of Illinois specialty crop growers to effectively market their produce through the development and implementation of a comprehensive marketing plan that incorporates online tools and social media (goal). By utilizing pre-workshop and post-workshop surveys (performance measure), we wanted to determine if workshop attendees' frequency of use of online media outreach would increase at least 50% (target) from their pre-season levels (benchmark) before taking the workshops. This was to be achieved by holding full-day workshops in the three main regions of Illinois (north, south, and central).

Additionally, the workshop attendees and other Illinois specialty crop farmers accessed online fact sheets, how-to videos, and monthly social media prompts developed by Second Cup Media and The Land Connection staff. These resources will continue to assist Illinois specialty crop producers in implementing the social media component of their marketing plan, enhancing the production and consumption of Illinois specialty crops for the future.

Objective 1. Provide Illinois specialty crop farmers with marketing fundamentals, and assist them in developing their own customized comprehensive marketing plan, including utilization of common social media tools and techniques.

1.1 Conduct a series of full-day specialty crop marketing workshops in the three main regions of the state. The workshops will:

- provide instruction on fundamental marketing skills and techniques to assist farmers in developing and implementing a marketing plan for their specialty crops
- providing instruction and resources on the different social media marketing tools, and how to use them
- provide marketing resources and tools to help farmers educate and connect with consumers

Performance Target: number of workshops held (3), and number of farmers attending each (minimum 40)

Achieved: number of workshops held (2), and number of farmers attending each (23 total)

We had difficulty reaching the performance target set for Objective 1 for several reasons outside our control. While we originally intended to have 120 attendees at the social media workshops, we fell short, with 23 attendees. A number of farmers contacted us asking if we could hold a workshop in their town, or said they could not spend a full day at a workshop when they could be working in the field. By changing the third workshop to a six-part webinar, we were able to meet our goal. Between the workshops and the webinars, we had 127 unique farmers interact with the workshops or webinars by May 2014, prior to our sending out the first social media starter kit. Over the reporting period, the webinars were viewed by 229 unique users, in addition to the 23 workshop attendees, bringing the total number of farmer who were reached by this project to 252.

1.2 Prepare and broadly disseminate social media support for Illinois specialty crop producers including and beyond the workshop attendees, including:

- online fact sheets

Performance Targets: number of fact sheets (5) and views of (1000 total)

Achieved: number of fact sheets (7) and views of (2600 total)

Second Cup Media was in charge of selecting which social media platforms to create fact sheets for and chose Facebook, Google+, Instagram, LinkedIn, Pinterest, Twitter, and YouTube. By June, at least 1700 people had viewed the fact sheets, primarily via our posting them on social media channels. We continued to include them in our social media posting for the remainder of the project. Not surprisingly, they did better on Twitter than Facebook for interactions, primarily because of social media specialists retweeting them.

Objective 2. Provide Illinois specialty crop growers with monthly "Social Media Starter Kit" that provides ready-to-use and customizable content to slot into their social media and other marketing efforts during the growing season.

2.1 Develop and disseminate customizable starter content for specialty crop farmers' social media and other marketing outreach efforts, including:

- Five monthly (from June to October) one-page starter kit sheets, which will consist of seasonal produce tweets (incorporating relevant hashtags), Facebook posts, photos, recipes, and "did you know?" information about specific in-season vegetables and fruits. Specialty crop farmers can use the monthly materials as-is, or customize for their farm and products. In addition to prompting them to implement their social media marketing plan, and making it quick and easy for them to do so, the starter kits will inspire the specialty crop growers to begin and continue doing their own social media outreach as part of their marketing plan.

Performance Measures/Targets: number of Starter Kits (5), and number of online impressions of the Starter Kit materials on The Land Connection's social media outlets (1000)

Achieved: number of Starter Kits (5), number of online impressions (1464)

We successfully created all five Starter Kits, sending one out at the start of each month, June to October. In total, we sent out 793 starter kits, which averages out to about 159 per month. As of November 25, 2014, all pages related to this project on our website received a total of 1464 unique viewers.

The first starter kit went out to the mailing list at the end of May. Of the 146 farmers who initially signed up to receive the kits, 81 of them opened the first email, which was a 59% open rate. July declined slightly to 52%, with 78 of 154 recipients opening the email. August went to 164, 72 of whom opened it, for a 46.5% open rate. September was sent to 167, opened by 72, for a 45% open rate. October was sent to 162, 65 of whom opened for a 41.7% open rate.

At the end of October, we sent out our first post-season survey. Several farmers responded immediately, and their feedback was helpful and reinforced many of the ideas we had about our progress. We sent out several additional reminders about the survey, but did not receive many more responses. Despite an average open rate of 42% for emails about the postseason survey, consistent with the overall open rate for emails sent in relation to this project, only 5% responded.

Survey results:

Did you attend a social media marketing workshop in person?

38% attended a workshop in person, 63% did not.

Did you watch any of the social media marketing webinars?

25% watched a webinar, 50% did not, 25% were unsure if they had.

Which social media platforms did you use for your farm business at the beginning of the season and end of season?

Platform	<i>Beginning of Season</i>	<i>End of Season</i>
Facebook	75%	75%
Twitter	25%	38%

Instagram	0%	38%
Pinterest	0%	38%

No respondents used YouTube, Tumblr or LinkedIn.

What kind of device(s) do you use for social media?

Smartphone	13%
iPhone	50%
Android	13%
Tablet	25%
Computer	88%

What other forms of marketing do you use for your business?

Website	75%
E-Newsletter	63%
Hard Copy Newsletter	25%
Blog	38%
Word of Mouth	88%
Paper Brochure	38%
Business Card	75%
Other	25%

About how often did you use the social media starter kits for your business?

Never	38%
Once per month	50%
Once per week	0%
Once per day	0%
I used them for ideas	50%

What do you use social media for your farm business?

Staying connected to customers	75%
Advertising products or services	63%
Sharing relevant information	63%
I don't use social media now	13%

Written feedback from the end of season survey included:

How did you use the social media starter kits?

"I didn't, but I hope to next season."

"I used those that applied and others for ideas."

"I used them for ideas but will likely use some directly next year for marketing."

"...checked them out to see what i could use right away or change up and make use of. followed links to website to check out your blogs and find recipes and articles of interest to my customers."

"It sparked lots of ideas. While not all of them were immediately relevant due to the nature of my work, it was very helpful to have. It absolutely helped me connect more frequently with our customers and potential customers leading to increased sales throughout the year"

What did you learn about social media as a tool for your farm business from the social media workshops and starter kits?

"I found it interesting on when to post, and how often."

"I should be doing more."

"Great ideas about how to better connect with customers."

"Loved the creative ideas for showcasing products and engaging followers."

"Most particularly how to change up my postings to get the best exposure, getting people to comment or share. ideas for types of things to post."

"There are so many more uses than I thought. If you do it well it can be helpful and you can have a good ROI with these tools. It takes time."

How did using social media help your business?

"I think it has been a very good way to keep our customers engaged and coming back. at this time of year, it is helping to let our customers know we are still open when so many farmers markets and farmstands are closed."

"We have been gaining a lot of publicity and referrals from our social media outlets and outside write-ups. Many of our customers at the market said they had been on our website and/ or follow us on facebook. Was a great way to advertise what we had available for products."

"I'm hoping to start using Facebook and maybe Twitter starting this winter and accelerating into next season."

"Got pictures and other education out."

"We are getting new "likes" and "followers" everyday. It has been great to see the impact of a few, simple posts and how many people it can reach."

"It helped us reach about 2000 more customers through facebook alone for this year. I anticipate it will lead to more CSA sign ups and more regular customers next year."

Do you have any other feedback for our program?

"Loved it!"

"Thank you, more please!"

"I would recommend it for new farms and farmers. Many of our social media programs were already in place, but it was great to have the added information. And the Second Cup Media people were very informative, and I thought they did a nice job."

"I'd love to see more social media guides and information. Maybe a webinar or 2 about marketing and branding."

"I appreciate the effort that went into it even though I didn't personally use it much this year."

"Thanks for the helpful suggestions and ideas!"

BENEFICIARIES

Provide a description of the groups and other operations that benefited from the completion of this project's accomplishments. Clearly state the number of beneficiaries affected by the project's accomplishments and/or the potential economic impact of the project.

The primary beneficiaries for this project were small Illinois specialty crop growers. According to the 2007 USDA Ag Census, there were 3894 specialty crop growers in Illinois. This project directly reached at least 1464 people. The materials are all available online and can be accessed by any Illinois specialty crop grower, regardless of their geographic location. Secondary beneficiaries of this project are consumers, chefs, institutional buyers, farmers' market managers, local food advocates, educators, and others.

LESSONS LEARNED

Offer insights into the lessons learned by the project staff as a result of completing this project. This section is meant to illustrate the positive and negative results and conclusions for the project. Describe unexpected outcomes or results that were an effect of implementing this project. If goal or outcome measures were not achieved, identify and share the lessons learned to help others expedite problem solving. Lessons learned should draw on positive experiences (ie good ideas that improve project efficiency) and negative experiences (ie lessons learned about what did not go well and what needs to be changed).

We did not experience any problems until March. At that point, we did experience some challenges with the workshops that we had planned. We held two of the three originally planned social media workshops, and found that the specialty crop farmers who attended found a lot of value in the workshops. The number of attendees, however, was lower than we expected. What we discovered when we were marketing the series, was that if the workshop was not in the town closest to the farmer, they were not willing to travel to attend the full day event—they often asked if we would consider holding a workshop in the town where they lived. We also discovered that a lot of farmers did not want to take a full day to attend, and asked if we would be posting videos so that they could watch when they had time.

We solved this by cancelling the third workshop and instead held six webinars that farmers can attend in the evenings, or watch at a later date, as they will be recorded and archived on YouTube. Because there was demand for the workshops, but the travel was a barrier, we decided to spit the last workshop up into six one-hour webinars that can be watched by specialty crop farmers at any time, from any location. This has turned out to be highly beneficial, because we can continue to refer farmers to the recorded webinars and other resources on our website, as well as being available to anyone, anywhere.

By September, we were having lower than ideal open rates for our emails and site views. Farmers self-reported being too busy to use social media as much as they would like, and we assumed that this extends to checking their email or looking for new, farm-related content as well.

CONTACT PERSON

Name, telephone, email

Report Submitted By: Cara Cummings

Title: Executive Director

Address: 505 West University Avenue, Suite 203

Phone: 217-840-2128

Email: Cara@thelandconnection.org

ADDITIONAL INFORMATION

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

Social Media Marketing Resources on our website: <http://thelandconnection.org/marketing-resources>

YouTube Channel: https://www.youtube.com/channel/UCmz-MiufoEh_fyNlfvOxzgA

Project Title:

Training Future Agricultural Professionals Honey Bee Colony Management.

Project Summary:

Problem: The honey bee population is beset with numerous problems resulting in the decreased production of honey and less potential for pollination that most specialty crops require. The economic impact for colony losses of upwards 19.5% and larger in Illinois could range anywhere from \$5 million to \$487.5 million. We put these facts into the curriculum.

Commercial beekeeping has suffered considerable losses. Smaller beekeepers haven't been much more successful.

In partnering with Illinois Agriculture Education in 2013 to teach a season of beekeeping through learning about the bee, SCBG2013 was an overall success. The general monthly plan with a solid schedule, committed students and mentors, the two participating schools increased their knowledge 120%. The reason for this is there was virtually zero percent knowledge about bees to begin with.

All agreed however, prior knowledge would have been helpful, and the mountains of material available to them was not helpful.

Expanding this into SCBG2014, added were three schools to participate in hands on learning (beekeeping), with a ten (10) unit lesson plan about basic bee biology to be given before attempting beekeeping.

Project Approach:

Ag In Progress continued to work with schools that had begun in this project. The added schools had no more than begun when most activity stopped due to various causes that will be discussed later. Those schools; Somonauk-Leland and North Boone, had or were starting specialty crops for their Crop Science Project

For the purposes of this report I will split this into the classroom curriculum objective and the hands-on beekeeping/crop science project.

Classroom Curriculum: We were approached by the central office of Illinois Association of Agriculture Teachers, (I.A.V.A.T.) One of our Pilot teachers was the President at that time. The I.A.V.A.T. works directly with the Illinois Board of Education because of the complexities of managing the many diverse disciplines within agriculture education.

After speaking with them we increased our goals to match a desired level of usefulness to them. (the teachers.)

Among the items identified were the impending transition to Next Generation Science Standards, (NGSS), page layout, lesson plan format and availability/cost of supplies or research material still needed to complete lesson plan, the lack of prior knowledge of honeybees; ie: bugs in general in many Illinois Acres of crops do not need pollinators and only deal with bugs that will harm crops.

Lesson plans were developed with the introduction to the honeybee from a biological perspective; a living organism, (not beekeeping), and make it relatable to what they were already familiar with.

In addition, every lesson plan was made to address items found through the scientific research in the REPORT ON HONEY BEE HEALTH:

<http://www.usda.gov/documents/ReportHoneyBeeHealth.pdf>

or

Short version:

<https://yosemite.epa.gov/opa/admpress.nsf/0c0affede4f840bc8525781f00436213/e04602a5e7aa060685257b5f004a12d3!OpenDocument>

We also sought and received permission to use all necessary documents and research used, saving teachers valuable time having to find qualified material themselves.

****Most material found was either solely related to beekeeping, too difficult (college level biology.), or didn't contain the types of material to balance (and prove) it would meet the standardized requirements of the state board of education system and there was too much to sift through.**

AIPP members were then invited to an IAVAT January 212 conference to present material developed thus far and to gain any additional information. It is at this time we identified a number of problems within the education material development it's self and decided to increase our goals once again to circumvent further pitfalls in order to make this as usable as possible.

Our end result has been received well among many high schools, collegiate and scientific communities. The scientists who have reviewed it and gotten back with us have liked the approach and understand the future potential for real time monitoring of honeybee colonies with a readily knowledgeable student populace among the nation's beekeepers.

We tried to thread many needles with what we created and feel we did well, although there were some difficulties resulting in a few time delays.

We were able to pare down the cost, of the 'kits', provide enough material free to each district to begin their learning. The teachers are happy overall with the results however,

some have found the level of difficulty too high yet were able to take or apply other lessons within the unit, then adapt those that needed to. Learning kits were provided for a total of eight FFA chapters; to The UIUC Pollinarium, and Chicago South Side Occupational Academy. Kit contents varied, but contained USB microscopes, flash drive and disbursement of teaching materials purchased for lesson plan development.

From here there are Professional Development ideas that are being floated among the leading honeybee researchers and their grad students.

Our Achievements include

Goals and Outcomes Achieved:

Our goal was to educate the youth of future farmers so that they may learn the intricacies of beekeeping and colony management for honey production and pollination.

When the project came to the conclusion, the FFA chapter was able to integrate and expand the number of colonies within their Crop Science Project. They started with two nucs (small frame 1/4 size starter hives) and developed a local breeding program to sustain and grow the population of colonies up to seven full-size.

These chapters learned about needs and methods of modifying landscapes and worked more effectively maintaining their diversified Crop Science Area. Knowledge gained during this project migrated into the community where USDA pollinator programs were begun in farm management and community awareness. The yield and quality increased and is credited directly with the bees.

Students were able to procure additional funds from outside sources to help strengthen honey bees/pollinators studies in their Crop Science Project. Interest grew and individual students purchased bees for independent studies and production. It is unknown how this will impact original colonies, however the new students were able to manage their colonies and create product with the help of a trained student/advisor from this pilot project.

In the spirit of the FFA's youth leadership program, they developed a teacher, student/advisor cooperative education system. It was challenging for the teacher and the assisting beekeeper/mentor to give each student a balanced Crop Science field education. A diversified Crop Science program can portray many of the challenges our agricultural industries face. There are a variety of issues to be addressed in a timely manner to give each product the care and attention it needs to maintain productivity and develop new markets. Here are some of the steps we think critical in developing foundation for self-sustaining and successful program.

Step One, develop project with coordinated group activity. This was done assembling hive components, which also gives opportunity to introduce needs and goals of a honey bee colony. It accomplishes two more things, ownership through effort and interest in its success. Interest is critical and enhances the learning process.

Step Two, over a short course of time, identify 1 or 2 students with interest and skills in colony observations. These students will become colony historian for FFA Chapter and student/advisors for the Crop Science program. They will assist the Mentor with each visit to the apiary. Suggested minimum training time for student/adviser, 2 years.

Step Three, the classroom Honey bee Ecology Unit developed during the grant period increased knowledge for both students and teacher. It's an open source curriculum which can be found at aginprogress.org website. Critical is classroom curriculum of Honey bee Ecology and or studying the anatomical, physiological properties necessary for success in diversified Crop Science Projects utilizing pollinators. Original knowledge survey scored a .001% this is both a blessing and a curse. It gives us the opportunity to frame content in a big picture or integrated systems view.*

Crop Science Projects provide the practical and science based experiences in the field that are required.

The success going forward is dependent on the support and professional development we are willing to provide our teachers. Attached is a poster presentation that was displayed at the AAPA/ABRC conference. This work has caught the attention of researchers and teachers alike throughout the bee research community.

The Universities and non-for-profits networks are working toward funding project mostly developed.

*as is expressed in the most recent NCR-SARE Book: Systems Research for Agriculture, which cites multiple case studies regarding integrated vs single faceted agriculture.

Beneficiaries:

The quantifiable beneficiaries of this project are innumerable as each student has demonstrated the capability to reach into the households and communities of so many.

By educating our next generation of future agriculture professionals using a science based approach to teaching about the very pollinators needed for crops, beekeepers, specialty crop growers and communities will benefit and reach beyond the millions.

From a moderate community of just over one thousand, **sixty students** were able to obtain and disperse enough knowledge to increase their community's growth potential in the foods they eat. It will increase because of everything from the more thoughtfulness to the pesticides they use around the home and how they use them, to adding pollinator friendly plants to their landscapes, in turn help to providing a healthy pollinator force as they (the pollinator) go about their business of helping to ensure a productive crop.

As well it was demonstrated that a typical row crop, or non-specialty crop, grower was able to assist and benefit, although not the intention of this block grant, it is also worth mentioning. He benefitted his soil by changing to cover-crops and by assisting the students in their needs for their pollinator dependent specialty crops of pumpkins and gourds.

One season with a few schools benefitted **thousands** in all of these ways and more.

Skills

Understanding students need for technical and critical thinking skills for maintaining agricultural productivity while developing diverse agricultural systems in a given area.

Innovations and technologies

With this broad base knowledge of pollinators increases the likelihood of advances in the agricultural sector that adds value for producers and helps maintain ecological balances for our pollinators.

Quality Assurance

We have worked closely with teachers, universities, researchers and state educational support organizations to ensure that the information is factually correct, relevant and usable for Illinois. Susan Kivikko, Lesley Deem oversight

Duplicable

The educational infrastructures we have developed this curriculum for is part of a larger national organization which makes it accessible to a larger audience.

Adaptable

Like our attention for Illinois, we can make minor changes within the curriculum to meet each states unique environment, promote agricultural knowledge and growth while maintaining the core honey bee lesson

What is needed: Longevity

The lessons can also be modified for each state as conditions change over time. We also plan to keep the information fresh by adding lessons or options which would include new research findings that would add value to the students educational experience on pollinator health.

Useable Research and Marketing information

A network of student scientist will be gathering real-time useable data on honey bee health. Beyond imparting knowledge and teaching new skills to students, these has the added benefit of providing potentially valuable data for reseachers.

Assets for Schools

The tools and equipment used in some of the lesson plans can then be used to expand lesson options in other subjects added in hopes that students and communities can build healthy, productive and diverse agricultural system they could benefit from.

Versatility

The tools and skills required in these lesson plans are transferable to other studies to enhance experiences that advance their agricultural future and careers.

Hands-On Mentoring:

As stated above, the first season with two chapters went well. Students were able to learn about the honey bee as they learned the art of beekeeping. Each month, students and their mentors opened their two colonies, watched the colony grow, learned to make a queen and all of the elements required to maintain colonies from season to season.

What we found differently in SCBG14 became quickly evident early in the season. As the education committee began to gather and plan the approach to translate the learning into lesson plans, those chapters that were to begin beekeeping had problems from the start.

The original chapters participating were North Boone High School in Boone County Illinois, and Somonauk-Leland High School in Somonauk Illinois. North Boone lost their bees and their advisor. The original mentor found it difficult to re-organize. * What we didn't see at the time was the original planning for this pilot was done over a period of time and well prepared for by each participating member.

With North Boone out for the season, we continued with Somonauk for a second season, and to repeat the work plan as SCBG_13_16 with three new, interested schools; Putnam County High School, Monticello High School, and Stark County High School.

Somonauk- had trouble early spring, were guided by mentor to keep bees alive-coordinated with beekeeper/(then)student teacher Riley Hintzsche.

New participating schools: all started with small starter colonies that had been inspected by the Illinois Department of Agriculture.

There were a few handicaps with our project. Summer schedules of students, advisors and beekeepers are always full during the summer months. As well, because of the many disciplines within agriculture education, (combined with these schedules) there were often times when all of the students interested were not able to attend a management session.

As is usually the case with Illinois Ag ED, they each set up their own system and lead students to manage the project information and communication.

Our biggest handicap was sick bees and/ or lack of knowledge about commitment requirements. Viruses and bacterial diseases set in quickly and most colonies did not make it into the summer. They also could not be replaced due to the state, or lack of, healthy bees nation wide.

Mentor Charley Nye was the only one to make it through a season work plan with sick bees. It should be noted that Charley is an exceptional beekeeper and was also the manager and beekeeper for the world renowned Gene Robinson's Genomic Laboratory.

Not all was lost however. The original work plan provided worked well to guide students through a season to learn about the honeybee and how closely it is tied to it's environment, as well as the elements, from those perspectives, to keep them alive in management.

Somonauk is now navigating environmental conditions with the continuation of beekeeping mentors. The entire community has changed in many positive ways. The colonies have expanded and the continuing beekeeping force has also.

Thus far, the hand-on experiences have translated into Horticulture classroom now working on pollinator crops, students' parents and row crop farming relatives deciding to plant and maintain pollinator friendly areas to make environment conducive to keeping bees all year. No grant funds were used toward these projects.

The ultimate success is for the continuation and not leave with a graduating class and they maintain the colonies they need for their communities pollination needs.

Although we had to give a more tangible goal for hands-on learning, ultimately it is in keeping honeybee colonies alive through many generations.

The schools with the difficulties are continuing to try but have decided to attempt learning first what they can in the classroom and beginning again with healthy bees, a broader knowledge base and the idea that through this process there are reliable resources to turn when difficulty arises; http://articles.extension.org/bee_health

Lesley Deem played a key role in overseeing the alignment with current science all inclusive as based through the 2013 USEPA USDA Report on Honeybee Health findings done through the National Honey Bee Survey. (NHBS). Lesley was also instrumental in keeping the focus of education on agriculture.

Tara McGill was most instrumental on lesson plan creation, meeting state standards in education for as many of those standards as possible. THE TEACHERS LOVE HER WORK- that cannot be understated.

Morgan Carr-Markell- fellow UIUC grad student, continuing work with honeybees, assisting Tara.

Steve Kivikko, concept designer, Education Committee Chair, instrumental in steering project, keeping on track, locating resources.

Susan Kivikko- Project Manager, responsible for budgets, reports and Permissions to use for all lesson plans included, locating resources.

Eric Whalen Pederson- (Phd.)Advisor; Education Committee.

Leighanne Hahn, Purdue (ret)), Advisor: Fieldwatch.

Dan Brinkmeier Chicago Field Museum (ret.)- Advisor, Education Committee; Learning Kits

Naaman Gambil, Garfield Park Conservatory Head Beekeeper, Beekeeper Education

Thadd Smith- Advisor; West Side Bee Boyz. Chicago After School pilot participation.

Retired teachers, Phill Bratta, Murry Weldon Editorial committee.

Toni Saso-Gabriel, Riley Hintzsche, Illinois Agriculture teachers participating in classroom pilot.

UW- clarifying data on plant sciences in nutrition section, Cornell- same as above.
At this point I am not sure how many of the details you would be interested in since this project has carried on to bigger and better things to get education to the teachers.

Fieldwatch, Inc.- creating specifically a unit program that parallels the active (live) sight to coordinate with training material developed.

Lessons Learned:

CHALLENGES:

Agricultural conditions are dynamic so content is designed to evolve and illustrates ways to keep our agricultural choices fluid and responsive for the variety of needs in a diverse system. Not everything we tried worked or easily.

Cooperative effort- Beekeepers have had their challenges and has been reflected with the Illinois State Beekeepers Association. With a volunteer organization consisting of only

eight members their capabilities a limited to the annual event planning for their meeting. We were able to work closely with a few of the smaller associations to for assistance. Those include Western Illinois Beekeepers,

1. Teacher/Advisor changes will have an impact on project outcomes if there isn't familiarity and/or has no lesson plan available.
2. Time and commitment need to start well in advance. Basic questions need to be answered before any interest is shown. *see intro and drawing them in activity.
3. Beekeepers need to work with Good Agricultural Practices. (GAC)
4. * Problem- communications through emails to teachers became a nightmare. The school's security systems allowed very little to go through. Beekeepers are not up to date on current technologies.

Contact Information:

Susan Kivikko northernbeekeeper@gmail.com
Tara McGill taraawmcgill@gmail.com
Steve Kivikko steve@aginprogress.org
Lesley Deem ldeem1@ldeem1@life.illinois.edu

It is difficult to know exactly where the work will end. What started as a simple project turned into a never ending road of opportunities for other educators and education creators. With honeybees come many questions. Because bees are so closely tie to their environment, our unit needed to go beyond our original goal and ultimately provided knowledge and tools students and communities can use to build healthy, productive and diverse agricultural systems that benefit everyone.

This is where I am not certain how much or little additional information or documents you would like. There are mountains of material generated for this project.

Other Documents

Feedback from IAVAT conference 2014.- a sampling of some of the documents- many of which have not been able to be retrieved by myself due to technical difficulties and data recovery problems.

Collinsville

Your feedback is very important to us! Please review the lesson and provide comments below.

Is the format of this lesson easy to read?

Not really

What is your average class size?

24

Is the format of this lesson able to be implemented without extra work done by the teacher?

No

Could you realistically implement this lesson in your classroom? Why or why not?

Yes, I would type up a lab handout. & Basic Bee PPT

Are the standards listed appropriate to your classes?

↑
make a

Yes

Which parts of the lesson work well? (Lesson plan Stage 1,2,3, Pre-lab assignment, Nosema Lab Class Data Sheet, Lab Report Rubric, Student Lab Report Guide, Journal article)

Stand alone lab Handout

Which parts of the lesson could use changes? Suggestions for changes? (Lesson plan Stage 1,2,3, Pre-lab assignment, Nosema Lab Class Data Sheet, Lab Report Rubric, Student Lab Report Guide, Journal article)

Procedure w/ Conclusion
& discussion questions

As a teacher using this in your classroom what other information do you need to carry out this lesson effectively?

Background info
Simple summary for teachers

PPT for students

If you were choosing 10 lessons to teach on honey bees and pollination, what would they be?

Would your school like to start their own hive? Please contact me

michelle.buckheit
@cchBK6.com

Would you like an observation hive (one to two frames of live bees behind glass) to be brought to some of your classes?

Yes

Other comments or suggestions (can use back):

Thank you for your feedback! 😊

Your feedback is very important to us! Please review the lesson and provide comments below.

Is the format of this lesson easy to read?

Some what

What is your average class size?

22

Is the format of this lesson able to be implemented without extra work done by the teacher?

NO

Could you realistically implement this lesson in your classroom? Why or why not?

NO Not enough equipment

Are the standards listed appropriate to your classes?

NO Sure

Which parts of the lesson work well? (Lesson plan Stage 1,2,3, Pre-lab assignment, Nosema Lab Class Data Sheet, Lab Report Rubric, Student Lab Report Guide, Journal article)

Lesson PLAN Stages 1, 2, 3

Which parts of the lesson could use changes? Suggestions for changes? (Lesson plan Stage 1,2,3, Pre-lab assignment, Nosema Lab Class Data Sheet, Lab Report Rubric, Student Lab Report Guide, Journal article)

As a teacher using this in your classroom what other information do you need to carry out this lesson effectively?

If you were choosing 10 lessons to teach on honey bees and pollination, what would they be?

What do you need to start?

Care and maintenance

How do they help environment

Would your school like to start their own hive? *NO*

Would you like an observation hive (one to two frames of live bees behind glass) to be brought to some of your classes? *yes*

Other comments or suggestions (can use back):

Thank you for your feedback! 😊

Your feedback is very important to us! Please review the lesson and provide comments below.

Is the format of this lesson easy to read?

Some too much

What is your average class size?

18

Is the format of this lesson able to be implemented without extra work done by the teacher?

no only around 30-35 minutes

Could you realistically implement this lesson in your classroom? Why or why not?

the beginning - need basic to move in depth

Are the standards listed appropriate to your classes?

yes

Which parts of the lesson work well? (Lesson plan Stage 1,2,3, Pre-lab assignment, Nosema Lab Class Data Sheet, Lab Report Rubric, Student Lab Report Guide, Journal article)

*1-4 ~~stages~~ Stages
rubric*

Which parts of the lesson could use changes? Suggestions for changes? (Lesson plan Stage 1,2,3, Pre-lab assignment, Nosema Lab Class Data Sheet, Lab Report Rubric, Student Lab Report Guide, Journal article)

*we are not as equipped to do a lot
of the labs - basic instruction*

As a teacher using this in your classroom what other information do you need to carry out this lesson effectively?

powerpoint

If you were choosing 10 lessons to teach on honey bees and pollination, what would they be?

1-4

Would your school like to start their own hive? *no*

Would you like an observation hive (one to two frames of live bees behind glass) to be brought to some of your classes? *no*

Other comments or suggestions (can use back):

Thank you for your feedback! 😊

Your feedback is very important to us! Please review the lesson and provide comments below.

Is the format of this lesson easy to read?

yes

What is your average class size?

12

Is the format of this lesson able to be implemented without extra work done by the teacher?

Could you realistically implement this lesson in your classroom? Why or why not?

Maybe, hard to determine.

Are the standards listed appropriate to your classes?

yes

Which parts of the lesson work well? (Lesson plan Stage 1,2,3, Pre-lab assignment, Nosema Lab Class Data Sheet, Lab Report Rubric, Student Lab Report Guide, Journal article)

Info given can be put into classroom well. Journal articles, lessons, etc could all work depending upon students in class.

Which parts of the lesson could use changes? Suggestions for changes? (Lesson plan Stage 1,2,3, Pre-lab assignment, Nosema Lab Class Data Sheet, Lab Report Rubric, Student Lab Report Guide, Journal article)

Time allotments of activities

As a teacher using this in your classroom what other information do you need to carry out this lesson effectively? Maybe a listing of local bee keepers for help/support.

If you were choosing 10 lessons to teach on honey bees and pollination, what would they be?

How to attract them	Marketing of honey
Diseases	Anatomy
Types of bees	Safety
How to harvest honey	Equipment used

Would your school like to start their own hive? No

Would you like an observation hive (one to two frames of live bees behind glass) to be brought to some of your classes? Maybe

Other comments or suggestions (can use back):

Thank you for your feedback! ☺

Your feedback is very important to us! Please review the lesson and provide comments below.

Is the format of this lesson easy to read?

yes

What is your average class size?

12

Is the format of this lesson able to be implemented without extra work done by the teacher?

Probably.

Could you realistically implement this lesson in your classroom? Why or why not?

I do not have many of pieces of equipment needed for this lesson.

Are the standards listed appropriate to your classes?

yes.

Which parts of the lesson work well? (Lesson plan Stage 1,2,3, Pre-lab assignment, Nosema Lab Class Data Sheet, Lab Report Rubric, Student Lab Report Guide, Journal article)

All parts seem like they would work well.

Which parts of the lesson could use changes? Suggestions for changes? (Lesson plan Stage 1,2,3, Pre-lab assignment, Nosema Lab Class Data Sheet, Lab Report Rubric, Student Lab Report Guide, Journal article)

As a teacher using this in your classroom what other information do you need to carry out this lesson effectively?

If you were choosing 10 lessons to teach on honey bees and pollination, what would they be?

Would your school like to start their own hive? *No thank you.*

Would you like an observation hive (one to two frames of live bees behind glass) to be brought to some of your classes? *No thanks.*

Other comments or suggestions (can use back):

Thank you for talking to us!
Thank you for your feedback! 😊

ESTABLISHED
LEARNING
STANDARDS

NEXT GENERATION SCIENCE STANDARDS

MS-LS1-4

HS-ESS3-4

Use argument based on empirical evidence and scientific reasoning to support an explanation for how characteristic animal behaviors and specialized plant structures affect the probability of successful reproduction of animals and plants respectively. (revisited from previous grade band)

Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

COMMON CAREER AND TECHNICAL CORE STANDARDS

Ag- Environmental Systems (AG-ENV)

Use analytical procedures and instruments to manage environmental service systems.

Develop proposed solutions to environmental issues, problems and applications using scientific principles of meteorology, soil science, hydrology, microbiology, chemistry and ecology.

Plant Systems Career Pathway (AG-PL)

Develop and implement a crop management plan for a given production goal that accounts for environmental factors.

COMMON CORE STATE STANDARDS

RST.9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9–10 texts and topics.

RST.9-10.1 Cite specific textual evidence to support analysis of science and technical texts, attending to the precise details of explanations or descriptions.

RST.9-10.2 Determine the central ideas or conclusions of a text; trace the text’s explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

RST.11-12.8 Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text,

verifying the data when possible and corroborating or challenging conclusions with other sources of information.

HSN-Q.A.1 Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data display

HSN-Q.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

HS-LS2 Ecosystems: Interactions, Energy, and Dynamics

HS-LS2-1.

Use mathematical and/or computational representations to support explanations of factors that affect carrying capacity of ecosystems at different scales. [Clarification Statement: Emphasis is on quantitative analysis and comparison of the relationships among interdependent

factors including boundaries, resources, climate, and competition. Examples of mathematical comparisons could include graphs, charts, histograms, and population changes gathered from simulations or historical data sets.] [*Assessment Boundary: Assessment does not include deriving mathematical equations to make comparisons.*]

HS-LS2-2.

Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales. [Clarification Statement: Examples of mathematical representations include finding the average, determining trends, and using graphical comparisons of multiple sets of data.] [*Assessment Boundary: Assessment is limited to provided data.*]

HS-LS2-7.

Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.* [Clarification Statement: Examples of human activities can include urbanization, building dams, and dissemination of invasive species.]

HS-LS2-8.

Evaluate the evidence for the role of group behavior on individual and species' chances to survive and reproduce. [Clarification Statement: Emphasis is on: (1) distinguishing between group and individual behavior, (2) identifying evidence supporting the outcomes of group behavior, and (3) developing logical and reasonable arguments based on evidence. Examples of group behaviors could include flocking, schooling, herding, and cooperative behaviors such as hunting, migrating, and swarming.]

HS-ESS3 Earth and Human Activity

HS-ESS3-3.

Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity. [Clarification Statement: Examples of factors that affect the management of natural resources include costs of resource extraction and waste management, per-capita consumption, and the development of new technologies. Examples of factors that affect human sustainability include agricultural efficiency, levels of conservation, and urban planning.] [*Assessment Boundary: Assessment for computational simulations is limited to using provided multi-parameter*

programs or constructing simplified spreadsheet calculations.]

HS-ESS3-4.

Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.* [Clarification Statement:

Examples of data on the impacts of human activities could include the quantities and types of pollutants released, changes to biomass and species diversity, or areal changes in land surface use (such as for urban development, agriculture and livestock, or surface mining). Examples for limiting future impacts could range from local efforts (such as reducing, reusing, and recycling resources) to large-scale geoengineering design solutions (such as altering global temperatures by making large changes to the atmosphere or ocean).]

<http://www.nextgenscience.org/hsets1-engineering-design>

2014 Specialty Crop Grant (SC-14-14) Final Report

Project Title

Horseradish Breeding and Propagation Research

Project Summary

The purpose of the Horseradish Breeding and Propagation Research project was to breed and propagate new high yielding, disease free and root discoloration resistant horseradish varieties. With existing horseradish varieties developing disease problems, losing vigor and internal root discoloration, breeding new varieties has become necessary in order for Illinois horseradish growers to raise saleable horseradish and compete in the world wide horseradish market. The diseased, low yielding discolored horseradish put Illinois growers at a financial disadvantage due to low quality, low yielding and unmarketable roots.

Project Approach

Horseradish Breeding at Southern Illinois University during 2014

S. A. Walters, Professor

Dept. of Plant, Soil, and Agricultural Systems, Southern Illinois University, MC 4415,
Carbondale, IL 62901

Horseradish Seed Collection. In 2014, we again focused on making crosses between several horseradish clones in the greenhouse to be evaluated under field conditions in 2015. We have been trying the last few years to introgress new Eastern European germplasm into the horseradish breeding program. I have about 5 to 6 germplasm clones that I have been crossing with adapted materials. We made a lot of crosses with these materials in the last few years and we will be selecting many of these out of the field in fall 2015. Anyway, we are also continuing making crosses among our adapted materials as well. Anyway, from where we began a few years ago, now we should be able to achieve more success with fewer seedlings from directed crosses than from seedlings obtained from the open-pollination of clones.

Seedling planting and evaluation. About 3,500 seedlings were generated from seed sown at the SIU Horticulture Research Greenhouse in 2014. These seedlings were transplanted into the field at Fournie Farms in Collinsville in mid-May 2014. Seedlings were generated from various focused crosses made in the greenhouse during 2013. Seedlings were dug in December and placed into cold storage at Fournie Farms. The seedlings were evaluated in December with 633 clones selected to be further evaluated in 2015 as first generation clones (Table 1). Internal root discoloration (IRD) was at a relatively low incidence this year and we saved about 19% of the

seedlings, thus we rouged out about 81% of the seedlings that were grown during the first year of evaluation.

Field Evaluation of First and Second Generation clones. Approximately 379 first generation clones (or 2013 seedlings) and 93 second generation clones (or 2012 seedlings) was planted at Fournie Farms in Collinsville in mid-May 2014. From these first generation clones, 56 were selected to be further evaluated in 2015 and 10 second generation clones were saved for further evaluation in 2015 (Table 2).

New Clonal Releases. We presented horseradish materials to growers at our early January 2015 meeting, and no new clones were selected for advancement, although 3 looked good to me – 1008, 1017, and 1019 (Table 3). This Table provides information from the grower evaluations done at the Twilight meeting on 12 January, 2015. Table 3 gives the cumulative overall exterior, interior and taste character ratings by horseradish growers for all selections. Most of the discussion at the meeting centered around storage issues with some of our cultivars.

Goals and Outcomes Achieved

Through the research outlined in Dr. Walters report, no new clones were chosen to advance to field production. None of the 2014 clones were outstanding enough to dedicate production horseradish acres. Although no clones were selected, Dr. Walters and his staff still collected useful information regarding the characteristics achieved through breeding crosses.

Beneficiaries

The Horseradish Breeding and Propagation Research project builds on itself each year. The beneficiary this year was significantly to the program itself. The absence of achieving any viable clones in 2014 removes the growers from receiving immediate gratification. However the research results provide meaningful information for Dr. Walters to utilize in future crosses. The development of new varieties each year allows growers to select varieties that are best suited for their growing conditions and soil types. With new varieties produced annually, Illinois horseradish growers are given the opportunity to function with financial stability and confidence their planting stocks will continue to produce high quality horseradish the industry demands. Unfortunately, this year the clone results did not display

more desirable characteristics than the current field production varieties. The program also furthers Dr. Walters research efforts and provides valuable research experience and knowledge for SIUC graduate students.

Lessons Learned

As in previous years, It was interesting to observe the various results of cross breeding lines. Crossing two desirable parent germplasm did not always produce a desirable outcome. Some offspring did not have the desired bio mass, flavor, or physical attributes. There were significant differences between “sibling” varieties where the same parent germplasm was used, however the offspring’s characteristics varied. These variances are what drive the need for such vast and detailed breeding programs to observe and select the most desirable seedlings.

This year the pool of clones lacked any outstanding potential. In discussion of the three top rated clones (1008, 1017 and 1019) many growers were more influenced by the “15K” parentage of the clones. The parent variety of “15K” was once a widespread field production variety which eventually caused many growers disappointment in their harvest yield and income. When faced with the potential risk associated with a “15k” decedent and the mediocre characteristics of the clones, growers chose to pass on the new varieties and maintain their current production varieties for another season.

Contact Person

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Horseradish Growers of Illinois
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SC-14-14 Grant Fund Expenditures: (\$38,429.10)

Fournie: (\$3110)

Weeding Labor (\$450)

Sprayer & Manage Plot (\$87.50)

Harvest Crew (\$487.50)

Plot Rent (\$1575)

Tractor/Digger Rent (\$510)

SIUC/Walters: (\$34,144.10)

Travel (\$644.10)

Greenhouse rent (\$2250)

Grad Student labor (\$17,496)

Dr. Walters Salary (\$10,000)

Vehicle Operation & Maintenance (\$2754)

Cooler Operation & Service (\$1000)

IL Growers: (\$1175)

Growers School (\$1175)

The attached Budget Information Table shows the expenditures of the grant funds.

Table 1. Horseradish Seedling Evaluation – 2014.

<u>Clonal Cross</u>	<u>No. plants saved</u>	<u>Clonal cross</u>	<u>No. plants saved</u>
BL 08-11 x BL 09-4	107	BL09-7 x AM 394	51
395 x 904	40	395 x 901	31
BL 11-6 x AM 465c	38	395 x 602	39
Unknown	26	305 x 902	31
BL 11-6 x 901	234	711 x AM 465c	36

Total Number seedlings 633

Internal root discoloration (IRD) characters included peppering, brown pegging, black and brown rings, yellow to tan core color, and mottled to total black internal discoloration. No tasting was done. Final result was 633 saved clones from the initial 3,500 seedling estimate.

Table 2. Number of First and second generation clones selected in 2014.

Parents and number selected

Parents and number selected

First Generation (from 2013 Seedlings) - 56 clones selected

BL 08-8 x Bruns 15K: 13 clones

Hungarian x 315: 3 clones

BL 08-09 x Hungarian: 10 clones

Hungarian x 802: 3 clones

BL 08-10 x Bruns 15K: 3 clones

Hungarian x AM 394: 2 clones

BL 08-10 x 503: 1 clone

405 x BL 11-3: 6 clones

BL 08-11 x Bl 09-4: 2 clones

Unknown: 9 clones

BL 09-1 x 601: 4 clones

Second Generation (from 2012 Seedlings) - 10 clones selected

Czech x 15K: 1 clone

15K x BL 08-3: 1 clone

15K x Hungarian: 1 clone

1573 x BL 08-6: 3 clones

405 x 8-5: 4 clones

Table 3. Horseradish Grower Evaluation of Potential New Clones – 2014.

Clone	Parent	Exterior Characters	Interior Characters	Taste Characters	Total Score	Potential Cultivar
1) 1001	(Unknown)	3.8	4.3	3.9	4.0	3.9
2) 1002	(316 x unknown)	2.1	3.4	2.5	2.7	2.0
3) 1008	[15K x (315xGrman sdlg)]	3.9	3.6	3.2	3.6	3.7
4) 1009	(1573 x 316)	3.2	3.6	2.6	3.1	2.9
5) 1010	[15K x (315xGrman sdlg)]	2.7	3.3	3.1	3.0	2.5
6) 1011	(Unknown)	3.1	3.1	2.6	2.9	2.0
7) 1012	(1573 X 15K)	2.3	3.1	3.4	2.9	2.1
8) BL 08-08 OP	315 x German selection	2.9	3.5	1.5	2.6	1.8
9) 1013	(1573 X 15K)	2.9	3.9	2.7	3.2	2.3
10) 1014	(15K x Czech)	3.2	3.4	3.3	3.3	3.1
11) 1015	(15K x Czech)	2.8	3.0	3.0	2.9	2.2
12) 1016	(15K x Czech)	3.4	3.2	2.2	2.9	2.7
13) 1017	[15K x (315xGrman sdlg)]	3.8	3.2	3.0	3.3	3.3
14) 1018	(Unknown)	3.9	3.9	3.4	3.7	3.4
15) 1019	(15K x Czech)	4.1	3.6	3.0	3.6	3.7
16) 1020	[15K x (315xGrman sdlg)]	3.2	3.4	3.2	3.3	2.6

Exterior, Interior and Taste Characters rated on scale of 1 to 5 with 1 = poor, 3 = average, and 5 = good. Total score is a mean of these three characters. The potential as a new cultivar was also rated by growers on scale of 1 to 5 with 1 = poor, 3 = average, and 5 = good potential for commercial development.

Highlighted clones are ones chosen for further advancement to field.

Current cultivars selected last year:

1001, 1003 , 1005 , 1006 , 1010 , 1011, 1012, and 1018.

Spring 2015 SIUC Horseradish Breeding Line (BL) and Recent Cultivar Release Information:

Breeding Lines:

BL 08-1 : 315 x 761A (2008 seedling selection)

BL 08-2 : 315 x 761A (2008 seedling selection)

BL 08-3 : 315 x 761A (2008 seedling selection)

BL 08-4 : 315 x German (2008 seedling selection)

BL 08-5 : 315 x German (2008 seedling selection)

BL 08-6 : 315 x German (2008 seedling selection)

BL 08-7 : 315 x German (2008 seedling selection)

BL 08-8 : 315 x German (2008 seedling selection)

BL 08-9 : SIU Czech outcross (2008 seedling selection)

BL 08-10 : SIU Czech outcross (2008 seedling selection)

BL 08-11 : SIU Czech outcross (2008 seedling selection)

BL 08-12 : SIU Czech outcross (2008 seedling selection)

BL 08-13 : SIU Czech outcross (2008 seedling selection)

BL 09-1 : 761A outcross (2009 seedling selection)

BL 09-2 : 315 x German (2009 seedling selection)

BL 09-3 : 315 x German (2009 seedling selection)

BL 09-4 : 7586 outcross (2007 seedling selection)

BL 09-5 : 1590 outcross (2007 seedling selection)

BL 09-6 : 1590 outcross (2007 seedling selection)

BL 09-7 : 315 x 15K (2009 seedling selection)

BL 09-8 : 15K outcross (2009 seedling selection)

BL 09-9 : 17-05 outcross (2007 seedling selection)

BL 11-1 : German x 1038, 2008 seedling

BL 11-2 : 1590 outcross, 2008 seedling

BL 11-3 : 316 outcross, 2008 seedling

BL 11-4 : 315 outcross, 2007 seedling

BL 11-5 : 1590 outcross, 2010 seedling

BL 11-6 : German outcross, 2008 seedling

BL 11-7 : 315 outcross, 2008 seedling

BL 11-8 : Czech outcross, 2008 seedling

New Cultivar Releases Plus a Few Others:

315 (seedling of 7586 outcrossed)

316 (seedling of 7586 outcrossed)

330 (seedling of V7E3 outcrossed)

395 (seedling of 15K outcrossed)

443 (seedling of 984 outcrossed)

402 (seedling of 1405 outcrossed)

405 (seedling of 769 outcrossed)

406 (unknown seedling)

501 (seedling of Czech outcrossed)

502 (seedling of 9553 outcrossed)

503 (unknown seedling)

601 (seedling of 316 outcross)

602 (unknown seedling)

711 (seedling of 1590 outcross)

801 (seedling of 761A outcross)

802 (seedling of 316 outcross)

803 (seedling of C22 outcross)

901 (seedling of Czech outcross)

902 (seedling of 15K outcross)

903 (seedling of unknown outcross)

904 (seedling of 316 outcross)

905 (seedling of Czech outcross)

906 (seedling of 1573 x 315 outcross)

1001 (unknown seedling)

1003 (315 x unknown male)

1005 (316 x unknown male)

1006 (316 x unknown male)

1010 (15K x BL08-6)

1011 (unknown seedling)

1012 (1573 x 15K)

1018 (unknown seedling)

1008

1017

1019

**EXPERIMENTAL STATION
61ST STREET FARMERS MARKET
ILLINOIS SPECIALTY CROP GRANT PROGRAM FINAL REPORT
SC-14-22**

Project Title: Increasing Demand Among SNAP Clients for Illinois Specialty Crops Sold at the 61st Street Farmers Market

Project Summary: The 61st Street Farmers Market, a program of Experimental Station, increases access to locally grown fresh and nutritious foods in Chicago's underserved Woodlawn neighborhood. 2014 Illinois Specialty Crop Grant funding enabled Experimental Station to provide at-Market, point-of-promotion, in-school, after-school and summer educational programming for low-income children and adults. Built on previous Illinois Specialty Crop Block Grant funding, this project enabled Experimental Station to continue to work toward realizing our long-term goal of rebuilding local knowledge among our community's low-income population of how to identify, grow, prepare and enjoy the foods sold at the 61st Street Farmers Market.

Project Approach: 2014 was a strong year for the 61st Street Farmers Market. Over the course of the year, we grew our farmer/vendor base to 27 during the outdoor season and, despite the early-arriving winter, were able to keep the number of vendors to 16-17 each week during the indoor season. Overall, the number of farmers and vendors selling at the Market increased to 30, a 10% increase over 2013. The Market's aim is always to increase the number of fruit and vegetable growers, in pace with increases in clientele; high quality, locally produced fruits and vegetables are the biggest selling point at our Market, which customers frequent for their weekly groceries, rather than as a tourist destination. It is notable that 89.5% of customers surveyed stated that they come to the Market to purchase fruits and vegetables. 64.5% of customers stated that they consume more fruits and vegetables, as a result of shopping at the Market.

Continual outreach in the local community through visits to DHS offices to talk with 60-70 new SNAP clients each week, handing out flyers in person at food pantries and senior homes, participating in a variety of outreach opportunities in Woodlawn, Hyde Park, Washington Park and Englewood throughout the year, placing ongoing Google Ads and weekly Facebook ads on the internet (almost 20,000 Facebook views alone in a week), brought our average weekly outdoor attendance to nearly 1,300 customers each week. 175 new SNAP customers frequented the Market in 2014.

SNAP and Double Value Coupon purchases by our low-income customers continued to be strong in 2014, reaching a combined total of \$32,847 for the year, though not as high as projected. We attribute this both to cuts in SNAP funding in late 2013, and Experimental Station's expansion of Double Value Coupon Programs to over 30 markets in the Chicago area in 2014, through our LINK Up Illinois program. With

our expansion of Double Value Coupon Programs to other farmers markets, low-income customers are able to purchase affordable farm-fresh, healthy foods in many Chicago neighborhoods.

We continued in 2014 to partner with the University of Chicago Medicine's South Side Diabetes project (led by Drs. Monica Peek and Marshall Chin, Co-Principal Investigators of the project), to build our Fruit & Veggie Prescription program launched in 2012. South Side Diabetes provided funds for the Fruit & Veggie Rx program and maintained a tent/table at the Market each week to welcome patients and provide weekly tours of the Market. Tours focused on healthy eating, seasonality of locally grown produce, how to prepare the produce available at the Market, and how to benefit the most as diabetics from the farmers market. Participants received \$7 in vouchers to spend on fresh fruits and vegetables at the Market.

In 2014, we partnered both with University of Chicago Medicine and Harmony WellCare to implement new healthy eating incentive initiatives for Medicaid/SNAP customers. Our *Eat Up!* pilot initiative enabled 121 SNAP customers to have their blood pressure and BMI tested on a regular basis at the Market, and receive information about healthy foods sold at the Market that lower blood pressure. SNAP customers also received \$5 in Health Bucks to spend at the Market each week they participated. *Eat Up!* participants spent \$1,100 in Health Bucks in 2014.

Education—(In-School Workshops, In-School Gardening, Cooking Classes, Summer Gardening, Market School/Chef Demonstrations and Tastings)

In 2014, we were able to take our Food Culture education initiative to a new level. Working with Carnegie Elementary School teachers, our Market manager provided 4 weeks of in-school healthy eating workshops for 170 2nd through 4th graders in late March and early April, followed by a 7-week in-school gardening program with 60 2nd graders. Students learned where food comes from, to identify different types of seeds, to germinate seeds and grow their own plants, how to tend and transplant them out of doors, how to compost with worms, how to identify and harvest numerous vegetables, how to identify weeds, and how to gather seeds from the plants for next year's garden.

In collaboration with The Urban Canopy, a socially responsible local urban agriculture business, the in-school and summer gardening classes were held in a nearby hoop house, which allowed the students to produce significant crops of radishes, lettuce, collards, kale, spinach, okra, several varieties of beans, six varieties of tomatoes, carrots, onions, beets, lemon balm, amaranth, three varieties of bell peppers and jalapenos. Following the end of the school year, the in-school gardening transitioned into our 8-week Summer Gardening program for neighborhood youths. Twelve youths learned throughout the summer to plant, transplant, tend, and harvest vegetables. In the fall, the in-school gardening picked up again with 60 2nd and 4th graders participating, completing the harvest. All crops were distributed to

the children, their families, and residents living in the low-income housing complex located next to the hoop house.

In the spring and the fall, Carnegie School 4th and 5th graders were invited to participate in after-school cooking classes, held in the Experimental Station kitchen. Two 3-week series of cooking classes taught the children sanitation, knife skills, and how to prepare simple dishes using a variety of fruits and vegetables found on the Illinois Specialty Crops list. Kale often showed up on the menu. It was delightful to see how readily children take to kale and other vegetables, if they have prepared the dishes themselves. Twenty-two 4th graders participated in the spring. Fourteen 5th graders participated in the fall.

With a request from Carnegie School parents and children who participated in the after-school cooking classes, we added two Healthy Holiday Cooking Classes for families in December.

Throughout the market season, our market manager organized and coordinated weekly at-market Market School activities and chef demonstrations, as well as tastings of Market produce at the local Department of Human Services office (where Illinois SNAP cards are issued). Market School activities included a range of instructional and educational opportunities for Market customers, including nutritional information, gardening, harvesting, composting food waste, and a variety of other topics related to buying and consuming locally and sustainably grown foods, health and wellness.

Goals and Outcomes Achieved:

1) Our marketing and outreach efforts were expected to result in increases in sales of Illinois Specialty Crops at the 61st Street Farmers Market of approximately \$10,900 (~64% of projected SNAP purchases of \$17,000) and \$9,000 (64% of projected Double Value Coupon purchases of \$14,000) as a result of purchases by SNAP beneficiaries in 2014.

SNAP purchases at the 61st Street Farmers Market totaled **\$17,505** for the year, while Double Value Coupon purchases totaled **\$15,342**, with a combined total of **\$32,847**. Fruits and vegetables represented 60% of the total SNAP and DVCP purchases in 2014, or **\$19,492**.

2) Through our promotional efforts, we expected to increase our average weekly attendance at the 61st Street Farmers Market to 850 customers in 2014, up from 650 in 2012. We anticipated that our average weekly attendance would increase to 750 in 2013.

From 2012 to 2014, the 61st Street Market greatly increased our average weekly attendance, far exceeding the goals we had set in early 2013 for 2014. The average weekly attendance for the outdoor reached almost **1,300 customers per week**.

3) Through our outreach efforts at food pantries, DHS offices, low-income housing and senior homes in the Woodlawn community, we expected to increase the number of SNAP shopper visits at our Market from 479 in 2011 and 575 in 2012, to 675 in 2013 to 800 in 2014.

The 61st Street Farmers Market recorded **873 visits by SNAP customers** in 2014. We altered our tracking system to be able to track unique customers as well as customer visits. In 2014, **469 unique SNAP customers** shopped at the 61st Street Farmers Market.

4) Through our educational efforts, we expected that at least 90% of local children and youth participating in our in-school workshops would gain increased knowledge of the nutritional benefits of consuming fruits and vegetables on the Illinois Specialty Crop list.

94% of children participating in our in-school workshops reported having learned something new about the benefits of consuming fruits and vegetables. **All** participants learned something new about how fruits and vegetables grow.

5) We expected that at least 75% of 4th graders participating in our cooking classes would increase their preparation and consumption of Illinois Specialty Crops.

85% of cooking class participants reported consuming more fruits and vegetables as a result of the cooking classes; **77%** stated that they ate different types of fruits and vegetables as a result of participating in the cooking classes; **69%** stated that they also cooked at home as a result of taking the classes.

6) We expected that, as a result of participating in our gardening program, 100% of the participants would report an increase in their consumption of vegetables and in their understanding of how vegetables grow.

The **120** second and fourth graders (60 in spring, 60 in fall) who participated in the in-school gardening classes were extremely enthusiastic about gardening, and planted, tended and harvested six 25' rows of collard greens, kale, strawberry spinach, Dragon's Tongue beans, Royalty Purple Pod beans, amaranth, okra, green bell peppers, yellow bell peppers, jalapenos, string beans, sun gold tomatoes, Cherokee purple tomatoes, Kelloggs Breakfast tomatoes, Indigo Rose tomatoes, Sweet Pea tomatoes, Brandywine tomatoes, French Breakfast radishes, Helios radishes, China Rose radishes, Detroit Red beets, Early Blood beets, arugula, rutabaga, Amish Deer Tongue lettuce, carrots, lettuce mix, onions, lemon balm. The fruits of their labor were taken home and shared with the residents of the Jackson Park Terrace low-income housing complex. **100%** of them reported having learned something new about how vegetables grow; **86%** of them reported an increase in their consumption of vegetables.

Beneficiaries:

- 469 unique SNAP customers who purchased foods from the 61st Street Farmers Market
- 175 SNAP customers who self-identified as NEW to the Market in 2014
- 170 2nd and 3rd graders at the Andrew Carnegie Elementary School who participated in the 4-week Healthy Eating Workshops
- 120 2nd and 4th graders at the Andrew Carnegie Elementary School who participated in the 7-week In-School Gardening program in spring and fall
- 22 4th graders and 14 5th graders who participated in the after-school cooking classes at Experimental Station
- 12 youths who learned to garden in the 8-week Summer Gardening program
- 13 Illinois Specialty Crop Farmers who received an additional \$19,492 in sales of Illinois Specialty Crops to 61st Street Farmers Market SNAP customers
- Almost 1,300 customers at the outdoor market and approximately 350 customers at the indoor market who purchased Illinois Specialty Crops each week for 35 weeks in 2014

Lessons Learned:

1) Planning For Climate Change. 2012 was a highly instructive year, during which the Midwestern fruit trees froze in the spring and farms suffered intense heat and drought throughout the summer. As a result, our produce farmers had little to sell at the Market in 2012 and the Market suffered. Since then, we have made it a policy to plan for climate chaos by recruiting more producers of fruits and vegetables than we thought the Market would need in a good year. This has paid off. In addition to never-ending outreach in the community, a chief reason for growth in clientele both from in and beyond our neighborhood is due to customer perception that our Market is thriving, under all seasonal and climate conditions. Perception of success leads to more success!

2) In-School Food Education. We've learned that, by building students' in-school experience and working closely with the Carnegie School teachers, all aspects of our in-school and after-school food education activities are increasingly successful. It is apparent that the longer food education is integrated into the classroom curriculum, the more lasting the benefits.

It is also essential to the success of the program not only to have support from head administrators for the in-school education, but from the individual teachers. They will make it happen, or not.

In the past two years, Experimental Station had developed a vision for a program whereby we would teach the teachers to provide the food education in their own classrooms. We learned from Carnegie School teachers that they—emphatically—do NOT want to take on the role of food educators or gardening instructors, even were Experimental Station to train them. The school and teachers are very appreciative of

the resources that Experimental Station brings to them, but they feel that they are not able to implement the program themselves, with the resources, depth and expertise that we bring.

3) *Eat Up!* Experimental Station carried out our *Eat Up!* pilot in partnership with University of Chicago Medicine and Harmony WellCare. University of Chicago Medicine provided volunteers to take and record health metrics on the *Eat Up!* app the Experimental Station had created. Due to often-erratic volunteerism, Experimental Station made the decision to hire *Eat Up!* attendants in 2015 to be able to ensure consistent and quality service for SNAP customers.

Contact Person:

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Additional Information:

In 2014, the Market undertook a study of 98 Market item prices at grocery stores on the South Side, to see how prices compared to those at the Market. We learned that for a basket of randomly selected organically grown foods representing major food groups (vegetables, fruits, protein, grains, and dairy), when the Double Value Coupon Program is factored in, prices at the Market are almost always the cheapest option among sellers in the study. The best savings were for Illinois Specialty Crops: apples, blueberries, cherries, raspberries, pears, bell peppers, kale, Portobello mushrooms, squashes, sweet potatoes. 61st Street Farmers Market average prices are 17% cheaper than average prices of comparable products at supermarkets and stores selling food (Target) on the South Side.



SC-14-24

NAME OF APPLICANT

Gary Comer Youth Center

PROJECT TITLE

Gary Comer Youth Center Specialty Crop Project

PROJECT SUMMARY

The purpose of the Specialty Crop Project was to increase nutrition knowledge of youth and adults and the availability of specialty crops in the Greater Grand Crossing neighborhood, located on the Southside of Chicago. The project was driven by the community data related to cases of diabetes and heart disease which were higher than the average Chicago neighborhood. This disparity was particularly felt when attempting to access healthy food as the community is a designated Food Desert. The focus of the project to impact food options and healthy lifestyle knowledge for the community played a role in positively impacting the lives of participants.

Over the past three decades, childhood obesity rates in America have tripled, and today, nearly one in three children in America are overweight or obese. The numbers are even higher in African American and Hispanic communities, where nearly 40% of the children are overweight or obese. The census data regarding Greater Grand Crossing shows a population where 96% are African-American.

In 2010, the Comer Science and Education Foundation's "Farm to Fork" proposal received funding from the Illinois Specialty Crop Grant program. The project facilitated the growth of more than 15,000 square feet of new growing space, partially supported 85 youth involved in seed-to-table gardening, and reached 800 GCYC youth, family and community members through a weekly food distribution program. The initial project facilitated the transition of the rooftop garden to a rooftop urban farm. Three additional growing spaces were developed: 1) a 15,000 square-foot community-based youth farm with a 20' x 60' hoop house; 2) an environmental education garden that creates a green campus between the Youth Center and a newly constructed high school; and 3) a backyard raised-bed garden.

The 2013 project was funded to (1) increase the amount of crop, number/scope of community food distribution events (2) allow for additional youth to be served in urban agriculture and nutrition education programs and (3) offer additional youth employment opportunities. Through the support of the Illinois Department of Agriculture's Specialty Crop Grant Program, the Gary Comer Youth Center developed a sustainable and replicable urban food system, cultivating a vibrant supportive community around the state's specialty crops.

PROJECT APPROACH – DISCUSSING ACTIVITIES AND PARTNERS

ACTIVITIES

January 2013

1. Developed pre/post survey and all tracking tools
 - The organization worked with an external evaluator to update and review pre/post survey for youth;
 - Excel is utilized to track yield from farm/garden; and
 - All youth attendance tracked via GCYC membership management system called Kidtrax.

2. Planned 2013 gardens including youth responsibilities
 - Developed participation guidelines and responsibilities for urban ag career exploration program;
 - Determined initial crop plan;
 - Developed Request for Proposal for design and construction of demonstration garden and nutrition education pavilion. The pavilion is funded by a grant through a corporate foundation; and
 - Started growing microgreens and specialty herbs.
3. Developed curriculum for the middle school enrichment, high school elective and Green Teen program
4. After-school programming related to urban agriculture and nutrition education occurred on a daily basis Monday through Saturday

February 2013

1. Purchased seeds, starter plants and equipment
2. Developed plan for community food distribution events
 - Youth planted micro-greens to be used in the catering program. This is the first step for the gardening and culinary students to work cooperatively to achieve a goal. This partnership will be further developed to prepare for food distribution events;
 - Garden Manager attended the Chicago Food Policy Action Committee meeting to become informed about current city-wide food policy initiatives. She plans to attend future meetings to determine areas of mutual interest; and
 - Made inquiry about becoming farmers for the Farmers Market Nutrition Program. The applications will be sent late March/early April.
3. After-school programming related to urban agriculture and nutrition education Green Teen program, high school and middle school elective classes continued Monday through Saturday
 - 20 youth participated in a field trip to Kendall College to explore careers in business, culinary arts, education and hospitality management. The trip increased nutrition knowledge and provided instruction on how chefs utilize fresh produce. This information will be further explored in preparation for future food distribution events; and
 - Youth conducted a Valentine's Day event and gained knowledge and skills required for future food distribution events. Instruction leading up to the event included: project planning, business plan development, materials and supply management, inventory management, marketing, publicity, customer service, packaging and distribution. Youth gained experience working as a team and developing work readiness skills.

March 2013

1. Planted spring crops
 - Outdoor seeding postponed due to unseasonably cold weather; and
 - Indoor seeding of vegetable crops started.
2. Harvested winter crops
 - Completed harvest of winter carrots, lettuce and mache.
3. Developed youth job descriptions and requirements
 - Youth job descriptions and applications were developed.
4. After-school programming related to urban agriculture and nutrition education
 - Green Teen program, high school and middle school elective classes continue Monday through Saturday;

- 24 youth participated in the planning and development of a GCYC-wide event for Earth Day, April 22. Youth will lead planting demonstrations on the rooftop garden and environmental education garden to increase awareness and participation in nutrition and gardening; and
 - 24 youth participated in the planning of the 2013 GCYC gardens, including crop selection, crop planning/yield schedule and distribution programs.
5. Other
- Ordered additional starter plants, seeds and trees;
 - Ordered gloves, uniforms and hand tools;
 - Awarded Learning Garden from the Kitchen Community to be installed in May. The Learning Garden will feature raised beds, shade sails and other enhancements in order to facilitate on-site nutrition and agricultural education; and
 - Reviewed 3 proposals submitted for the Youth Education Garden Enhancement Project: three teams of architects, landscape architects and green professionals presented plans for an outdoor educational structure to host a farm stand and educational classes for youth and the community. The project is on schedule for installation in spring/summer 2013 (funded through other sources).

April 2013

1. Planted spring crops including broccoli, cauliflower, chard, collards, kale, leeks, lettuce, mustard greens, onions, potatoes, sorrel;
 - Indoor seeding: tomatoes, basil, herbs; and
 - Winter row covers removed, soil tilled and prepared for spring planting.
2. Harvested winter crops including spinach, peas shoots
3. Developed promotional materials
 - Flyer templates created for Earth Day which can be adapted for Illinois Department of Agriculture activities.
4. After-school programming related to urban agriculture and nutrition education
 - 24 youth participated in the planning and delivery of a GCYC-wide event for Earth Day. Youth led planting demonstrations to increase awareness and excitement around specialty crops, nutrition and gardening. More than 180 youth attended Earth Day; and
 - 24 youth participated in the planning of the 2013 GCYC gardens, including crop selection, crop planning/yield schedule and distribution programs.
5. Other
 - Youth employment packets were made available on April 23rd. More than 70 applications have been distributed so far;
 - Received application for Illinois Farmers Market Nutrition Program. GCYC will seek to be a vendor through this program allowing individuals to purchase produce with vouchers;
 - The full-time Farm Production Assistant started as well as two students working after school; and
 - Selected architect to lead the Gateway Garden project.

May 2013

1. Youth completed post survey
 - All GCYC youth completed organizational post-survey.
2. Planted summer crop
 - 36 flats of summer crops were delivered 5/13. Crops include herbs, tomatoes and edible flowers; and
 - Bee hives started.

3. Harvested spring crops: broccoli, lettuce and herbs
4. Recruited, interviewed and hired youth
 - More than 50 youth have been recruited and interviewed for summer positions.
5. Distribution promotional materials for distribution events
 - Draft of flyer for summer programs and activities is completed. Plans are underway to finalize with dates, additional information and logos.
6. After-school programming related to urban agriculture and nutrition education
 - Continues daily

June 2013

1. Food distribution event
 - Harvest Table - June 28
2. Conducted pre survey - Completed for urban agriculture content specific questionnaire.
3. Harvested summer crops: collard greens, kale, garlic scapes, onions, edible flowers, chives, broccoli, lettuce, mustard greens, sorrel, herbs, tomatoes, strawberries, snap peas, radishes.
4. Provided youth employment
 - Increase in the summer, see outcomes below.
5. Distributed promotional materials for distribution events – created and distributed
6. After-school programming related to urban agriculture and nutrition education
 - After- school programming continued through June 7th, summer program starts June 17th.

July 2013

1. Harvested summer crops and track output
 - Youth maintained crops by harvesting, watering and weeding; and
 - Includes: potatoes, tomatoes, peppers, blueberries, strawberries, herbs, basil, kale, collard greens, beans, flowers, chard, cucumbers, squash, eggplant and zucchini.
2. Provided youth employment
 - Programs run Monday-Friday from 9am-5:30pm;
 - Each Friday, a small group of Green Teens work at the Shedd Aquarium with a horticulturist. Youth maintain vegetable gardens, prairie and perennial beds; and
 - Completed assessment of personality interests and related those to professional career fields including green careers.
3. Summer programming related to urban agriculture and nutrition education
 - Included personalized visits to educational table and chef demonstrations/tastings;
 - Trip: Prairie Wolf Forest Preserve. Visit and tour including sensory activities during and after the trip. Included breakout activities with DePaul professor;

- Trip: North Park Nature Center and City Farm. Visited Nature Center and completed a guided hike with a naturalist. Guided tour of City Farm and compared GCYC Gardens to work done there. Completed breakout activities with DePaul professor;
 - Trip: Chicago State University. Tour of campus and prairie garden. Presentations by GIS, Geography, Biology and Environmental Science Departments. Toured Aquaponics facility and farm; and
 - Trip: O'Hare International Airport Gardens in the Sky. Visited exhibit at O'Hare featuring GCYC rooftop garden.
 - Guest Speaker: Kathryn Lwin, River of Flowers.
4. Installed Gateway Garden which includes gravel lock, planters, benches, irrigation system, shade structures, modular walls, educational space

August 2013

1. Food distribution events capturing attendance
 - 3 Harvest Tables and 4 Farm Stands averaging 30 people each.
2. Provided youth employment
 - Field trip to DePaul with the Department of Environmental Science including presentations from professors, tour and admission presentation;
 - Volunteered at Shedd Aquarium by maintaining gardens; and
 - Completed mock interviews and built resumes.

September 2013

1. Food distribution events -Various
2. Harvested summer crops
 - Gardening, maintaining, harvesting continue daily; and
 - Herbs, peppers, zucchini, cucumbers, tomatoes, kale, eggplant, collard greens, strawberries, sweet potatoes, beans (all organic).
3. Provided youth employment
 - Interviews and orientation for youth occurred in September. Employment assessment completed for participants assessing key career and college readiness skills; and
 - Youth participating in employment opportunities related to specialty crops (some funded by other sources).
4. After-school programming related to urban agriculture and nutrition education
 - Daily programming including high school elective, middle school enrichment and Green Teens; and
 - The Greencorps program started with 15 youth on Sept. 28 and will continue through June 10, 2014. Focus areas: specialty crops, bicycle maintenance/transportation and urban forestry.

October 2013

1. 4 food distribution events occurred in October, promoted to 50 staff weekly and visited by 5-10 community members.
2. Fall produce such as organic: collard greens, kale, green tomatoes, Swiss chard, carrots, radishes, spinach, leaf lettuce and sweet potatoes were available;
3. Planted: spinach, leaf lettuce, mache, mustard greens, head lettuce; and
4. After school program related to urban agriculture and nutrition education continues daily.

November 2013

1. Harvested winter crops
 - Organic: collard greens, spinach, kale, carrots, lettuce, swiss chard, cabbage, potatoes, sage and rosemary.
 - Planted bulbs and garlic.
2. After-school programming related to urban agriculture and nutrition education programming
 - Continued daily including culinary classes.
 - Future Energies Exhibition field trip—learning about careers in engineering, planning, architecture, and energy consulting. Visited Energy Garden. Youth were able to engage with energy in a variety of ways. Green Teens were broken up into five groups and competed to create a sustainable city.
 - Created terrariums to demonstrate a mini ecosystem.
 - Two day activity related to understanding the benefits of essential vitamins and minerals.

December 2013

1. Harvested winter crops
 - Root crops were harvested and the rest were covered. Carrots will be pulled through February; and
 - Additional winter crops will be harvested in the hoop houses in January/February.
2. After-school programming related to urban agriculture and nutrition education
 - HAQ (assessment to demonstrate 21st century skill readiness) administered to Green Teens;
 - Maintain gardens, monitor crops, harvest (organic: spinach, lettuce, kale, swiss chard); and
 - 15 youth participated in a soil science workshop led by DePaul's Environmental Science Department. Dr. Ann Kennedy from USDA was on hand as a guest instructor.

January 2014

1. Plan 2014 gardens including youth responsibilities
 - Purchase seeds, starter plants and equipment
 - As crop plan is finalized and as seed inventory is used in the next few weeks, purchases will be made for winter seeds
2. Develop plan for CSA
 - Initial discussions have occurred with members of target audience to evaluate the proper model for CSA
3. Regular programming
 - 25 Green Teens participated in programming in January, 50 youth applied
 - Besides maintaining the farm and garden, 50 Earth Boxes are managed by the Green Teen group
 - A former Green Teen was selected by the GCYC community to receive an award on MLK day due to her volunteer service within the community and garden/farm specifically
 - Additional programming included Middle School enrichment, High School elective and Greencorps
4. Youth employment program
 - Youth participated in interviews, orientation, handbook review, employability assessment
5. Monthly review of outcomes, strengths and areas for improvement by leadership team
 - 2014 grant deliverable meeting occurred on Jan 22nd with the Farm Manager, Garden Manager, Senior Program Director and Grants Manager

February 2014

- Regular programming/Youth employment program
 - Youth continue to monitor rows and row covers throughout the winter
 - Identify green careers based on research and interest/skill set, developed action plan for future steps
 - Green Teens are meeting 15 hours per week to work on projects based on specialty crops, green career exploration, nutrition and technology. (not solely funded by IDOA)
 - Greencorps Teens meet 10 hours per week to work on specialty crop/forestry projects. (not solely funded by IDOA)
- Monthly review of project
 - Monthly grant status meetings senior leadership
- Harvest winter crops
 - Limited due to cold weather

March 2014

1. Plant spring crops
 - Planting of spring transplants began
 - Indoor seedling carts are full
 - Open spaces in hoop houses received crops to grow such as organic beets and turnips
2. Harvest winter crops
 - As weather warmed, plants were able to be harvested
3. Hire seasonal farm staff
 - 3 youth starting late March
4. Regular programming
 - High school elective and middle school enrichment classes continue
 - Green Teens and Greencorps continue to meet 10-15 hours per week
5. Monthly review of project
 - Monthly grants compliance meetings continue
6. Ongoing marketing
 - Met with a potential restaurant partner and continued outreach to local corner grocery store for distribution opportunities

April 2014

- Plant spring crops/harvest winter crop
 - Lettuce, spinach, broccoli, cauliflower, direct seeding
 - Lettuce and spinach harvested
- Regular programming continues daily
 - Green Teens
 - High school elective, middle school enrichment
 - Cooking/baking classes
 - Spring break special events and field trips
- Youth employment program
 - Youth employed on rooftop and farm
- Ongoing marketing
 - Working on getting a label for bagged produce

May 2014

- Nutrition education materials developed for distribution events
 - Youth have completed nutritional signage for seasonal vegetable crop
 - Youth completed the 'adopt a row' unit and field guides for spring and summer crops were completed to be used to support summer distribution events
- Plant summer crop
 - Summer crops planted at farm and succession plantings continue
- Harvest spring crops
 - Continues – all organic: broccoli and cauliflower specifically, lettuce, onions
- Distribute marketing materials for distribution events
 - A flyer was created to promote harvest table and farm stands at GCYC
 - More than 150 summer staff and partners were invited to collaborate and attend the events and to promote amount their networks
- Regular programming
 - School year program continues through early June including elective, enrichment and after school urban ag
- Youth employment program
 - Finishing up Spring 2014 employment program
 - Recruitment and interviews for summer positions initiated
- Post survey
 - Green Teens and Greencorps youth completed post-survey

June 2014

- Continued distribution to food pantry, grocery store and restaurant
- Not conducting CSA summer 2014 as previously planned, potential for fall
- Harvest summer crops
 - Tomatoes, first harvest of squash/zucchini
- Regular programming
 - Programming transitioned from after-school to summer which included shut-down weeks to prepare for summer and conduct professional development trainings
- Youth employment program
 - See numbers below, heavy focus for summer starting the last week of June

July 2014

- Food distribution events and tracking included food pantry, Farm Stands and Harvest Table
 - 32 events held in July including 4 Harvest Tables with approximately 150 people attending
- Bus transport clients to distribution events
 - Mather Lifeways members will attend Harvest Table in August
- Distribute CSA
 - CSA will not occur during summer months
- Grocery store sales to local non-profit grocery store, Louis' Groceries and 6 deliveries of edible flowers to the Publican Restaurant

- Harvest summer crops: greens, squash, potatoes, garlic
- Regular summer programming
 - Provided 8 hours of programming for youth ages 10-13 for 5 weeks through GCYC's summer camp reaching 32 youth per week. Programming was delivered via a partnership with UIC Extension.
- Youth employment program
 - 20 hours per week for 5 weeks of green career/urban agriculture employment
 - 20 hours per week for 5 weeks of Greencorps which includes horticulture
 - 6 youth working 15-20 hours weekly on Farm
- Ongoing marketing: occurring via Farm Stands, existing network and weekly Harvest Table

August 2014

- Distribute CSA
 - Three peak-season CSA distributions
- Weekly donations to food pantry
 - Continues, one week saw deliveries at two different pantries
 - Donation of a meal to a woman's homeless shelter
- Grocery store sales
 - Two weekly trips
 - Analysis of supply/demand so no food is wasted
 - Only supplier of collard greens at this location
- Harvest summer crops
 - Bumper crop of organic: onions, potatoes, squash, tomatoes
- Regular programming
 - Greencorps continued through end of August, Green Teens through middle of August
 - Provided academic and enrichment classes for about 30 7/8th graders starting late August
- Youth employment program
 - 170 youth enrolled in three teen employment programs
- Ongoing marketing
 - Weekly flyer distribution for Harvest Table

September 2014

- Food distribution events and tracking of this data continues. We made as many donations to food pantries as possible this month since the farm stand events were finished in August
- The first succession of winter crops began in September. The final hoop plantings will be in October once the tomato and pepper plants are pulled. We had our first ever harvest of honey with a total of 120 pounds from four of our five hives.
- Regular programming: Garden classes were provided for 40 6th grade students starting Sept. 2. The students receive 3 hours of instruction per week. Goals of the program: Youth will have the opportunity to apply science, technology, and environmental science and math concepts in a hands-on experiential outdoor learning environment.
- Horticulture Elective Class: 15 high school students meet 2.5 hours per week to learn about horticulture and explore Green Career pathways. This 16-week class will also focus on the application of STEM principles in an outdoor, hands-on, experiential learning environment.
- Youth employment program: Green Teens: The fall session of Green Teens started Sept. 15 with about 20 youth. We are continuing to recruit and enroll to reach the goal of 30 youth between Sept – December 2014.
- Ongoing marketing: We had a farm dinner using our produce from the gardens. We also continue to build relationships with local restaurants for a solid partner in our mission and for our produce.
- September tracking of harvest data continues each day. The crops have slowed down with the weather, but the cool loving crops continue to produce well.
- Pre-survey for fall programs

October 2014

- Harvest fall crops: Gary Comer Middle School students, Gary Comer College Prep High School students and an after school program, Green Teens, harvest crops on a regular basis.
- Programming—About 60 youth ages 10 - 18 during in school and out-of-school programs participate in urban agriculture and horticulture classes
- Youth employment program continues daily: 24 youth participate up to 9 hours per week on green career and urban agriculture and agribusiness projects.
- Ongoing marketing - New marketing materials will be created in the coming months from data gathered this summer and things we have learned about our community in the last year.
- Daily tracking of crop yield conducted by farm staff

November 2014

- Harvest fall crops: Gary Comer Middle School students, Gary Comer College Prep High School students and an after school program, Green Teens, harvested the last of the crops.
- Programming—About 60 youth ages 10 - 18 during in school and out-of-school programs participate in urban agriculture and horticulture classes
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PARTNERS

Programming

- Guest speaker from Southern Illinois University, a professor in Landscape Horticulture and a Landscape Architect discussed green career pathways.
- DePaul University - The Environmental Science Department worked with 6 graduate students and Green Teens to evaluate healthy soil profiles in up to 6 community lots. The group proposed future green infrastructure for the lots.
- DePaul University Steans Center funded two environmental science interns at Gary Comer Youth Center summer 2013 through the Morris Foundation.
- Museum of Science and Industry – GCYC garden staff participated in a day-long training on experiential learning with a focus on improving teaching strategies in science, technology, environment and math. AGCYC staff member will participate in a week-long teacher training in July designed to further enhance teaching skills and curriculum linked to Common Core standards for middle school and high school.
- Chicago Botanic Garden: supplied new weather station and 2 portable devices to promote science and math instruction in the garden.

- Partnership with E.A.T. Chicago: participated in workshop to implement 48 Earth Boxes throughout the GCYC campus to increase vegetable production capacity. Worked together to develop electronic system to track yield. Two tablets were donated to support this project.
- In February the youth completed two field trips to indoor farmer's markets to gather information and ideas for food distribution in 2014. The two farmer's markets were the Green City Market at the Nature Museum and the 61st Street Market at the Experimental Station.
- E.A.T. Chicago: Held "Tasting Thursday" with the physical education classes during which more than 120 youth tasted cucumbers and peppers harvested from the garden. Additionally, GCYC partnered with a high school teacher to create nutrition labels for the plants in the Earth Boxes.
- Farm staff developed a crop plan and planted a pickup truck bed for an educational organization called Truck Farm Chicago. The truck will travel to schools in Chicago and teach students about growing and eating healthy food.
- Partnerships with Depaul University, Shedd Aquarium, Field Museum and E.A.T. Chicago led to career and college pathways for youth

Professional Development/Networking

- GCYC Garden Manager attended Mid-American Horticulture Trade Show and Conference to network with industry professionals and identify educational opportunities.
- GCYC Garden Manager participated in a meeting at the City Colleges of Chicago to discuss the development of an urban agriculture certificate program. She met with additional potential partners from Loyola University, Chicago Botanic Garden, E.A.T. Chicago, The Kitchen Community, Chicago State University and the Illinois Institute of Technology.
- Farm Manager attended the Midwest Organic Sustainable and Education Service Organic Farming conference
- School Garden Conference June 29th at CBG: Full day of hands on instruction, workshops and professional networking to further school gardening programs. Particular emphasis on introduction of manual on how to grow food to be used on site in school cafeterias.
- Illinois Campus Compact Conference June 26th: More than 20 Illinois institutions of higher education participated in a day-long conference to promote educational and career pathways from high school to college. Two GCYC staff members presented at the conference.
- Two staff attended the Good Agricultural Practices training through the Illinois extension office.
- Two staff attended the Midwest Organic and Sustainable Education Service farm conference.

Food Distribution Partners

- Louis' Grocery. Weekly distribution. A sign in their store indicates produce grown at GCYC.
- Significant donations made weekly to Inner City Missions Network and Carey Temple Church. GCYC is providing the only source of greens for this pantry.
- Mather Lifeways. A non-profit dedicated to developing and implementing their 'Ways to Age Well' program

Volunteers

- Hosted DePaul University's Food Systems/Urban Agriculture Class for presentation and tour (15 participants).
- Hosted a workgroup with Urban Partnership Bank. Over 30 volunteers came to assist with farm tasks.
- Hosted BelBrands Chicago for Gateway Gardening dedication ceremony on Sept. 25. Four representatives from BelBrands attended, along with 10 Green Teens and 10 GCYC staff.
- 15 volunteers from Depaul University assisted at the farm.
- 3 DePaul workgroups assisted on Saturdays in October (25 people total).

Other

- Awarded Kitchen Community award including 12 raised beds, seating, a shade structure and 2 art poles.
- Funded through a non-governmental source, GCYC is partnering with DePaul University to study the food system in the community. The data collected will be used to plan for additional ways in which specialty crops can be distributed.

- DePaul University continues to collect and track data for Harvest Table and farm stand events (supported via other funds)

GOALS AND OUTCOMES ACHIEVED

The activities allowing GCYC to achieve its goals are listed in the above section.

The project has 4 main goals.

Increase availability of locally grown organic specialty crops.

Target = 4,000 pounds

Total yield = 13,113 pounds.

GCYC is now able to accept WIC vouchers through the Farmers Market Nutrition Program.

Hold specialty crop distribution events for the community.

Target = 10 community food events

116 community food distribution events.

Activities surrounding distribution events

- Gardening workshops with an average of 10 community members attending the workshops focused on spring salad gardens and summer container gardeners.
- 8 members of the University Of Chicago Medical Center participated in a three-hour volunteer day designed to inform the community about the GCYC gardens and related programs.
- Tasting and culinary demonstration each Harvest Table
- Educational components developed by youth including 'how seeds spread', 'butterflies', information on various crops, tasting demonstrations, nutrition education, environmental education, importance of soil and herb drying.

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Increase nutrition education related to specialty crops.

Target = 160 youth participate in urban ag and nutrition programming

Target = 75% of youth increase knowledge related to specialty crops

330 unique youth participated during the reporting period in five different urban agriculture programs.

97% of participants scored at least an 80% on post-program knowledge tests.

1959 young people with active memberships during reporting period including nutrition discussions/workshops/daily healthy meals.

Foster youth development through employment experiences.

Target = 20 youth hired

254 unique youth employed in urban agriculture career exploration (primarily funded through other sources).

BENEFICIARIES

There were numerous groups/individuals who benefitted from the project including:

1. Greater Grand Crossing Community. Community members were able to take part in food distribution events; thereby increasing the potential for specialty crop consumption. The sheer number of pounds of produce made possible through this project was much higher than expected. The yield was distributed throughout the community in the various ways mentioned above - over 13,000 pounds.

2. Gary Comer Youth Center members. Young people were able to participate in 5 different types of programs offered throughout the grant period. Their knowledge regarding specialty crops increased due to classroom based lessons and hands-on work in the garden/on the farm.
3. Families visiting food pantries. The 2 main food pantries listed above served as a key distribution point and resource for visiting participants. In some cases, the food distributed by GCYC was the only fresh produce available at the food pantry.
4. Gary Comer Youth Center staff. Staff were able to run high quality programming and develop new partners. The organization was able to support 330 youth in programming and 254 youth in employment opportunities, partially due to funding received through this grant. As youth development professionals, the opportunity to deliver high quality programming is critical. The opportunity for young people to do something they enjoy related to specialty crops and earn a wage can be life-changing.
5. Local Non Profit Grocery Store. Through the program, the store received produce otherwise unavailable or too costly for its customers. Ultimately, consumers were able to have more options for specialty crops at lower prices.
6. Local Restaurants: The relationships were important to connect youth to business opportunities related to specialty crops. The exposure to economic opportunities was valuable for young people looking to explore careers related to specialty crops.

LESSONS LEARNED

1. Demand: There is a demand for food grown locally in the Greater Grand Crossing Community that is both healthy and organic. Price is an important factor to healthy purchasing habits in the community so offering fruits and vegetables free/low price was critical to meeting the demand. Distribution events were a great platform to talk to consumers about their needs and challenges in obtaining specialty crops. Several expansion ideas were discussed with residents including building of a community garden network.
2. Changing purchasing habits is a long-term goal. The organization must continue to press on with many more growing seasons and continue to educate the community.
3. A sustainable model of production is a challenge. Providing local and healthy produce offerings at such a low costs means that we will continue to seek funding for projects that meet our goals of changing eating habits of families in our community.
4. Young people involved in growing food makes a great impact on the system. Often times the demand for our produce is driven by the customer's desire to support the young people in their work—seeing that growing specialty crops is a safe alternative to other options in the community. Our young people are engaged students, entrepreneurs and leaders in their communities.
5. Crop selection is key to meeting the changing demands of consumers. While we grow unique vegetables to expose people to different options, the bulk of the efforts focus on crops that are in higher demand to feed a hungry community.

All goals and outcomes were achieved and exceeded.

GRANT EXPENDITURES

Month	Amount Expended to Date
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January	\$2,321.16
February	\$4,642.32
March	\$11,846.36
April	\$17,478.59
May	\$20,243.03
June	\$20,243.03
July	\$27,784.11
August	\$35,187.82
September	\$37,963.44
October	\$40,631.17
November	\$42,184.11
December	\$45,597.55
TOTAL	\$45,597.55

REPORT SUBMISSION INFORMATION

Report Submitted By: Ayanna Thomas

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Date Submitted: 12/17/2015



Illinois Department of Agriculture Final Grant Progress Report

SC-14-25

NAME OF RECIPIENT

Illinois Stewardship Alliance

PROJECT TITLE

Growing the Supply and Demand of Specialty Crops in Illinois

PROJECT SUMMARY

Our overall goal was to increase specialty crop markets through advertising, consumer outreach and marketing to restaurants. Illinois has an abundance of prime farmland, yet the state imports more than 95% of its food. At the same time, demand for locally produced food is growing. There is an economic niche that Illinois specialty crop producers are poised to fill, creating jobs and economic growth throughout rural Illinois. Local food production strengthens the fabric of rural Illinois, especially when Illinois farmers' develop direct relationships with local consumers and restaurants. More people become directly and financially invested in local communities as networks of businesses such as farmers and restaurants grow.

Unfortunately, many farmers don't have the time or business savvy to conduct their own marketing campaigns to take advantage of this market niche. In a 2012 survey of over 50 farmers in Illinois, only indicated that about 50% of respondents had a product list they could share with restaurants yet restaurants were the number one area where farmers expressed interest in expanding their sales.

Restaurants have definitely been looking for locally produced food. The National Restaurant Association (NRA) conducts an annual "What's Hot" survey for chefs across the country and in the 2013 survey locally grown produce was the #2 trend, right behind locally sourced meat and seafood. In ISA's 2012 survey, chefs indicated that they were interested in buying local produce but 50% didn't know where to find it. We began our farm to restaurant initiative in 2012 and have heard repeatedly from chefs that they are interested in utilizing more locally grown food and they would like it to be easier to attain. Furthermore, ISA's survey revealed that if obstacles to procuring local food were adequately addressed, 100% responded in saying they would purchase locally grown food. These trends have continued since that time.

This project built upon a previously funded Specialty Crop Block Grant Project, Phase Two: Growing the Specialty Crop Industry: Farm to Restaurant and Beyond. Results from the project so far have included a number of successful Chef-Farmer Networking Events, an informal network of chefs and farmers, in-depth research on the rules and regulations that specialty crop producers must comply with and guides for farmers and chefs were created and we have been using them in our outreach to assist in understanding the best practices of sourcing local.

PROJECT APPROACH

Through this project, our approach was to:

- 1) educate and assist chefs in finding print and online databases to locate farmers including the Buy Fresh Buy Local Central Illinois directory, University of Illinois Extension's MarketMaker program and Illinois Department of Agriculture's farmers market list;

- 2) connect chefs with new and existing farm cooperatives, online ordering opportunities and distributors featuring locally produced food including a pilot project for online procurement by restaurants; and
- 3) organize chef-farmer network and organizing networking events so that chefs and farmers can build relationships that are essential to expanding local food markets; and
- 4) research the opportunities for online marketing to provide a streamlined way for farmers to reach restaurant markets.

Chef-Farmer Networking Events

In March 2014, we held 4 chef-farmer networking events with approximately 140 attendees in Peoria, Springfield, Bloomington-Normal and Champaign-Urbana. The networking events invited specialty crop producers and chefs to come together and hear from a panel of experienced growers and chefs about the best practices of sourcing and distributing locally produced food.

In March 2015, we built on the previous year's events with a follow up event intended to help restaurants better understand how to reduce waste and purchase local, specialty crops with consideration for their bottom line. Presented by chef and educator, Greg Christian of Beyond Green Partners, participants learned strategies to stretch their food dollars and improve efficiencies in order to free up money to spend on higher costs of local food.

Outreach

We attended and exhibited at the Good Food Festival and Conference in Chicago in March 2014 and March 2015 where we conducted outreach to over 500 consumers as well as chefs.

Farm to Table Events

We developed promotional materials, ran advertising and set dates and locations for the Local Flavors farm to table series which give an opportunity for specialty crop producers to market their products to restaurants. We have identified prospects of Local Flavors hosts and are working on organizing 40 events - 20 lunches and 20 dinners in central Illinois. Dates and locations for 40 Local Flavors events were finalized with 10 events (5 lunches and 5 dinners) in each of the following cities: Springfield, Champaign-Urbana, Bloomington-Normal and Peoria. 1 ended up getting canceled due to the chef leaving resulting in 39 total events.

We instituted a Local Flavors Ambassador program to ensure that the Local Flavors events go well. Ambassadors will be staff and/or volunteers who will attend the Local Flavors event and provide educational material to attendees, answer questions and provide support to the restaurant as well. Staff and volunteers will attend the Local Flavors event and provide educational material to attendees. Training materials were developed for both the restaurants and volunteers. This was to address the issue that has happened at some events in the past where we worked with a chef or owner and they didn't communicate clearly to their front of house staff so servers didn't let customers know about the event or even customers would go into the restaurant and have to ask about the Local Flavors and the server wasn't aware of it.

We drafted a specialty crop producer directory of farmers who participated in the chef-farmer network to share with chefs who host Local Flavors events so they can identify farmers who are able and willing to sell to restaurants.

Paid ads ran for Local Flavors and the promotion of specialty crops through the Harvest Media Desk program at WUIS, Springfield's local National Public Radio affiliate and an independent online magazine, Smile Politely. Additionally, we developed a partnership with a TV station in C-U to feature Local Flavors through their Central Illinois Living program.

Online Ordering

We researched and develop a plan for a pilot program to encourage business partnerships between Springfield-area growers and buyers. We did an inventory of the online tools and technology available to provide information about the availability of locally grown and produced foods. Next we will look at the potential methods of collecting up-to-date product lists from local producers on a regular basis and electronically distributing them to local restaurants. We will conduct a survey of specialty crop producers that market or deliver into Springfield, IL to determine the interest in a cooperative marketing project and write a summary report that outlines the findings from the research. Additionally, we began researching

the online restaurants and have begun identifying examples of online ordering that we can learn from. There are many examples across the country - run by cooperatives, non-profit organizations, private businesses and more. Our goal was to learn about the process, software and other details of existing efforts to connect specialty crop growers with restaurants across the country to determine what models may work here.

We worked with Illinois Institute for Rural Affairs to conduct a survey of specialty crop producers to better understand their interest in participating in an online ordering project and determine some of the logistics as to how it might work. In November 2015, we presented the results to a group of farmers.

Project Partners

Project partners included: Urbana's Market at the Square/City of Urbana, The Land Connection, Downtown Bloomington Association, Peoria Riverfront Association and U of I Extension. Partners helped to promote networking events and Local Flavors program.

GOALS AND OUTCOMES ACHIEVED

The goals stated in the application were as follows:

GOAL: 120 of Illinois' restaurants participate in a "10% local" campaign and thereby increase their specialty crop purchases.

This goal was modified from the original goal because the 2012 campaign has been delayed in the start of the campaign and to ensure the success of reaching the goal with a realistic target.

PERFORMANCE MEASURE

The number of restaurants who make the pledge to work towards sourcing ten percent of their produce locally. Number of restaurants will be tracked and updated annually.

BENCHMARK: 0 Restaurants

TARGET

(2013): 60 restaurants take "10% local" pledge by the end of the project period.

(2014): 120 restaurants take "10% local" pledge by the end of the year.

GOAL: Increase the number of Local Flavors events facilitating the purchases of specialty crops by restaurants

PERFORMANCE MEASURE

The number of restaurants participating in Local Flavors events and sourcing locally produced specialty crops.

BENCHMARK: 19 events (2012)

TARGET:

(2013) 40 Events

(2014) 50 Events

Actual:

(2013) 40 Events

(2014) 40 Events

The first goal was not reached and we determined mid-project that it was not a feasible portion of our greater project. The 10% campaign was scrapped because we had difficulty getting chefs to "buy-in", they were hesitant to commit to tracking and our staff capacity was limited to police amounts. From our

previous report: "While most of the pieces of this grant project were completed, we ultimately decided to not move forward with the 10% campaign. There were a number of complicating factors including the differing opinions on the ability of restaurants to meet the 10% (some thought it was too high, others too low), the difficulty in reaching chefs and restaurants owners (the outreach is extremely time-consuming), staff turnover at ISA (previous staff had started this project), the amount of resources (especially staff time) is not enough to successfully complete this project."

We were able to do an extensive amount of outreach to farmers and chefs to promote specialty crops through well-attended networking events and Local Flavors programming.

Key Project Outcomes

Of restaurants that participated in the Local Flavors series (17 of 39 restaurants responded or 43%):

- 88% purchased locally grown specialty crops on a regular basis
- 71% said using locally grown specialty crops increases their gross sales
- 75% their purchases of specialty crops increased in 2014
- 71% said they continued to buy from farmers that they purchased from for Local Flavors event
- On average, 78 customers attended Local Flavors events (39 total events)

Unfortunately, economic data was often not provided or inconsistently answered. On asking how much was spent on locally grown produce in 2014, answers ranged from 50,000-16000/year.

Of those attending the 2014 chef-farmer networking events (21 of 140 responded or 15%):

- 85% of attendees stated they were able to make worthwhile connections for future purchasing
- 95% of attendees rated the events "excellent" or "very good"
- Additional comments included:
 - "Attended Peoria, Bloomington, Springfield and Urbana as a farmer. Bloomington was not as well attended, but the others were great. We have acquired new customers as a direct result of the Mixers in Peoria, Springfield and Urbana."
 - "The approach used was great: a friendly welcome received; well-organized approach encouraged ease and freedom to dialogue; written materials, networking"
 - "Great format with information introductions, panel discussion and plenty of time to mingle."

Online ordering results highlights (36 responses of 150 sent or 24% response rate)

- 64% have ability to sell specialty crops via wholesale markets
- 43% had sold wholesale in previous year
- 76% were willing to collaborate with other farmers in order to sell to restaurants
- Top challenges of selling wholesale were: 1. Inconsistent quantity, 2. Insufficient quantity and 3. Access to refrigeration
- Regarding transportation: 20% needed someone else to transport
- 38% would pay a membership fee if it meant they could expand their market
- At least 27 farmers (77% of those responding) are potentially interested in an online ordering pilot project.
- Somewhat more than half of respondents feel they have the ability to wholesale, although somewhat fewer than half are actually doing it.
- Most respondents are interested in collaborating with others to wholesale, even though most lack

previous experience with such collaboration.

- Between 1/3 and 2/3 of respondents are potentially willing to pool their products for sale, depending on their confidence in how their farms' individual brands will be handled.
- Slightly more than half of respondents would be willing to pay 5%+ fees for marketing, assuming they are getting value for their money. Some other respondents may be willing to pay amounts between 0% and 5%.
- Respondents overwhelmingly feel technologically prepared for online ordering.
- Other feedback included:
 - "We do too much to set ourselves apart as a better grown product. I would not want our name and brand lost within a co-op with other producers who do not have the same set of standards for production."
 - "I am interested in the idea, but am not sure of...being able to provide consistent product yet. We are just starting out and have not established a consistent product base or farm system. ..."
 - "My volume of product is too small and too perishable."
 - "Not sure if the distance would warrant participation."
 - "I am concerned about production planning and costs. Online ordering implies inconsistent demand for product. ... I would be more interested in a system that secured sales contracts with projected crop types and quantities at the beginning of the season..."

BENEFICIARIES

We reached over 200 specialty crop producers across the state ranging from less than one acre to over 100 acres of specialty crop production. The majority of our focus was on central Illinois targeting members of the BFBL Central Illinois chapter and the Central Illinois Sustainable Farming Network (approximately 85 members in both the chapter and in the network). Members of the BFBL Central Illinois chapter range from diverse vegetable operations with hundreds of varieties of vegetables, herbs, fruit, and cut flowers.

LESSONS LEARNED

Partnerships are key to success, especially with outreach efforts to farmers and chefs and helping secure event locations. Farmers and chefs are very busy, and they don't often sit down at a computer or near a phone, so they are really hard target audiences to reach. We continue to try multiple tactics to reach participants including phone, text, email, snail mail and in-person visits. We also try to piggy-back mixers on existing events that farmers or chefs usually attend. For example, in Peoria the chef farmer mixer was held in conjunction with the monthly meeting of a professional chefs association, and in Springfield we held the mixer in conjunction with the Illinois Farmers Market Association conference.

Timing is also important, because farmers and chefs often work long hours and have limited time to leave their restaurant or farm. We timed the events in the late winter and very early spring so it was a slower time for farmers and even for restaurants in most cases. We also had more success with chefs when holding the event on Mondays, when some restaurants close and many are slower.

Overall, chefs were interested and willing to work with farmers but sometimes what they say doesn't match their practices. For example, many chefs told us that they wanted to see emailed product lists but farmers who shared that they created a list and sent out weekly, said chefs rarely ordered from it and often just came to the farmers market.

There is definitely concern about "green-washing" which is difficult to police. In some cases,

restaurants have listed a farm name on their menu only to find out that they aren't actually buying from the farm.

While most of the pieces of this grant project were completed, we ultimately decided to not move forward with the 10% campaign. There were a number of complicating factors including the differing opinions on the ability of restaurants to meet the 10% (some thought it was too high, others too low), the difficulty in reaching chefs and restaurants owners (the outreach is extremely time-consuming), staff turnover at ISA (previous staff had started this project), the amount of resources (especially staff time) is not enough to successfully complete this project.

One of the biggest obstacles is to easily and efficiently communicate with chefs. They are so busy and often not near a phone that it is difficult both for farmers and others supporting farmers to work with them.

Overall, anecdotal evidence and survey results suggests sales to restaurants continue to grow and farmers attribute the work of Illinois Stewardship Alliance to their increased sales (through networking events, marketing campaigns and Local Flavors program).

CONTACT PERSON

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ADDITIONAL INFORMATION

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



SC-14-26

Final Grant Progress Report

Project Title

*Specialty Crops Education & Awareness through Illinois Agriculture in the Classroom
Pumpkins Ag Mag*

Project Summary

Successfully reaching Illinois consumers with a message of the importance of agriculture and awareness of the specialty crop industry means the message must take many different forms. Illinois Agriculture in the Classroom has a rich history of being the agriculture education resource for teachers to utilize in classrooms, beginning as young as kindergarten, then cultivating their knowledge and interest in agriculture and specialty crops throughout their education.

The IAA Foundation received \$15,000 to allow IAITC to develop and print a new *Pumpkins Ag Mag*. This resource not only increased awareness of the specialty crop grown in Illinois, but also introduced more students and consumers to the ideas of locally grown foods, and the farmers that grow them, ultimately helping consumers of all ages gain an understanding and appreciation for agriculture as a vital part of every day life.

The *Pumpkins Ag Mag* continues to be one of the most popular lessons, particularly in the fall months when teachers are decorating their classrooms and planning field trips to the pumpkin patch. The popularity of pumpkins as a classroom subject matter is a draw to educators, and has become a favorite theme to incorporate into lessons throughout the year—even when they're not thinking directly about agriculture. IAITC has captured this ideal opportunity to educate students and teachers about this specialty crop grown by producers in Illinois, help them make the connection between foods and the farmers who grow them, and inform about specialty crop items that can be found at farmers' markets.

The *Pumpkins Ag Mag* and subsequent classroom lessons and activities feature Illinois specialty growers and highlight how and where they are grown, where you can find them locally, and the many ways Illinois pumpkins are being used, and not just for Halloween!

The *Pumpkins Ag Mag* was developed by IAITC Education Specialists and reviewed by various agriculture, specialty and topical experts from Illinois including the Illinois Department of Agriculture and the Specialty Growers Association. The *Pumpkins Ag Mag* is linked to Common Core education standards, making it a sound education resource for any classroom activity.

Grant dollars make the *Pumpkins Ag Mag* to be available to teachers at no cost. Copies of the *Ag Mags* are shrink-wrapped in classroom sets of 30 for convenient distribution.

Once the materials and resources were created, end users received essential training and support to engage local educators and students. Without the reliable support network of IAITC County Coalitions and Ag Literacy Coordinators, IAITC would not effectively reach more than 550,000 students and 37,000 teachers annually. This proven and effective delivery model is a grassroots approach to programming. Much of this is supported through teacher trainings and grants to the County Coalitions that fund the work of the Ag Literacy Coordinators. It is these coordinators who hold the vital contact and trusted relationships with their local educators. Funding through this grant was critical in order to maintain this delivery model.

This project builds on previously funded projects by keeping up to date and accurate lessons on pumpkins grown as specialty crops in Illinois.

Project Approach

The *Pumpkins Ag Mag* was developed to showcase pumpkin growers in the state of Illinois. Lessons cover a variety of learning standards including more history and science as well as a focus on nutritional benefits. One example of science lesson features the new varieties of pumpkins that farmers can grow through cross pollination. Helping students identify where specialty crops are available locally is also included. Local growers and their specialty crop farms are featured in interviews that appear in both the hard copy version of the *Ag Mag* as well as a SMART Board version. In the SMART Board capable lessons, the *Ag Mag* comes to life. Students can click on interactive activities and can watch interviews with growers and be “transported” to their specialty farm without leaving the classroom.

The first step to prepare for development of the new *Pumpkins Ag Mag* entailed conducting research and holding interviews. IAITC state education staff conducted research and identifies subject matter experts. They also videotaped interviews for use in both the print and SMART Board lessons. The *Pumpkins Ag Mag* was developed in consultation with experts within the Department of Agriculture, as well as other experts in specialty crops including the Illinois Specialty Growers Association.

Next, IAITC state education staff began to write and review content of the *Pumpkins Ag Mag*. Staff worked with the same group of experts on multiple reviews of material, making it a priority to ensure information was both accurate and up to date.

The *Pumpkins Ag Mag* will then designed and edited by Illinois Farm Bureau Promotion and Graphic Arts Departments. This department handled the design of both the print and electronic versions of the publication.

All materials, including the *Pumpkins Ag Mag*, additional lessons and hands-on activity suggestions can be accessed by teachers any time online at the IAITC website.

The IAITC structure utilized its established built-in delivery mechanism to distribute the new materials on pumpkins, ensuring strong outreach and information dissemination. There remains no direct shipping costs related to Ag Mag delivery.

In spring of 2014, Ag Literacy Coordinators from throughout the state of Illinois received extensive training on new and updated materials. Materials were then subsequently showcased to teachers at Summer Ag Institutes & other various trainings throughout the summer and fall of 2014. Counties offered Certified Professional Development Units for Teacher Training. These courses (taught in 1 hour increments) were used for teachers to earn re-certification in Illinois. Teacher training is offered at the county level to further encourage local connections to the subject.

In fall of 2014 County Coalition Grants were distributed to 69 Ag Literacy coalitions in total amount of \$535,000. This support for IAITC county program implementation is crucial in order to effectively reach students and teachers. Agricultural Literacy Coordinators effectively fill the role of agricultural education consultants by introducing teachers to the concepts of specialty crops and how to incorporate the subject into planned lessons of language arts, math, science and social studies.

Finally county data was collected in the summer and fall of 2015 to measure outcome related to new pumpkin and specialty crops materials.

Goals and Outcomes Achieved

Learning objectives for the *Pumpkins Ag Mag* and subsequent lessons were met through the entire grant period and included:

- Teach students how to make the connection between food, nutrition and health.
- Use farmer stories as a vehicle to teach reading, writing, and science concepts.
- Encourage students to think about where their food comes from, distinguish between fact and fiction, observe flavor, color, texture, nutritional quality and safety, and write about personal experiences.
- Students will learn about the specialty crop industry, what specialty crops are grown in our own state, and how to find out if foods are locally grown.
- Students will identify locally grown foods available at farmers' markets or other local retail outlets.
- Students will be introduced to different cultural traditions surrounding foods.

IAITC set the following goals with expected measurable outcomes:

- Increase consumer awareness of specialty crops by distributing 70,000 *Pumpkins Ag Mags* annually.
- Increase nutrition knowledge related to pumpkins as a specialty crop by 75% by educating teachers during IAITC training sessions.

Teachers involved in training sessions gained a basic understanding about the connection of specialty crop foods and nutrition and health. Teachers also gained an understanding on how agriculture subject matters can be used to teach the core areas of math, science, language arts and social studies. To document this, all teachers involved in a training

session took a pre and post test. From this, IAITC can quantify the percentage of knowledge gained. In 2015, Pre and post testing was administered to 3rd and 4th grade teachers that participated in IAITC training sessions. The following results show significant increase in knowledge and awareness of pumpkins and specialty crops:

Please check all topics you plan to teach in your classrooms:

TOPIC	PRE	POST	INCREASE
Apples	71%	89%	18%
Pizza	20%	40%	13%
Flowers	27%	54%	27%
Plants	57%	66%	9%
Pumpkin	57%	92%	35%
Specialty crops	4%	32%	14%
Gardening	16%	40%	24%

As part of the requirements to attain county grants through the IAITC program, County Ag Literacy Coordinators are required to report any classroom activity including subject matter and number of students reached on both a monthly and annual basis. From these reports, IAITC can measure the number of lives directly impacted through educational lessons and experiences related to specialty crops, farmers' markets, or specific topics such as pumpkins.

2013-2014 IAITC IMPACT DATA

- IAITC resources utilized in 61% (2,150) of school centers in the state of Illinois
- 516,452 Students reached with IAITC lessons
- 36,074 Teachers use IAITC materials during the school year
- 558 Teachers participated in 38 Summer Ag Institutes, and 1,203 pre-service teachers received training through 57 presentations on incorporating ag into the classroom
- Book grants totaling \$17,018 provided new ag-related chapter books to 82 teachers and libraries across the state
- 1188 hours of CPDU provided to teachers, the equivalent of nearly 154 full days of training
- 36 teachers and 1152 students in Chicago classrooms were adopted by farmers for the Adopt-a-Classroom year long pen pal program.
- \$524,000 in grants awarded to 67 local ag literacy programs serving 77 Illinois counties
- Over 4,502 volunteers annually engage with students and teachers
- Illinois counties invested over 2.2 million dollars in ag literacy

2015-2015 IAITC IMPACT DATA

- IAITC resources utilized in 62% (2,231) of school centers in the state of Illinois
- 549,370 Students reached with IAITC lessons
- 37,483 Teachers use IAITC materials during the school year
- 576 Teachers participated in 26 Summer Ag Institutes, and 1,106 pre-service teachers received training through 62 presentations on incorporating ag into the classroom.

- Book grants totaling \$14,238 provided new ag-related chapter books to 51 teachers and libraries across the state.
- Container Garden Grants helped 221 schools, 51% in urban communities, experience growing food, including specialty crops, first hand by providing tools and books to start their own garden.
- 1343 hours of CPDU provided to teachers, the equivalent of nearly 192 full days of training.
- 39 teachers and 1201 students in Chicago classrooms were adopted by farmers for the Adopt-a-Classroom year-long pen pal program.
- \$532,000 in grants were awarded to 69 local ag literacy programs, serving 79 Illinois counties, allowing them to grow and strengthen local grassroots efforts.
- Over 4,900 volunteers annually engage with students and teachers.
- Illinois counties invested nearly 2.2 million dollars in ag literacy.
- 37,146 Students reached with lessons related to Pumpkins
- 1,403 Teachers reached with lessons related to Pumpkins
- 26,183 Students reached with lessons about Specialty Crops
- 1,503 Teachers reached with lessons about Specialty Crops
- 64,000 Pumpkin Ag Mags distributed

Beneficiaries

Raising awareness of Pumpkins as a specialty crop, while educating consumers on the impact and importance of agriculture, provides many benefits to the Illinois specialty crops industry. IAITC serves as an effective tool to increase child and adult knowledge and consumption of specialty crops.

IAITC lessons help students, teachers and parents alike understand that as consumers of specialty crops like apples, pumpkins, popcorn, horseradish and herbs, they are a part of agriculture and can better connect and identify with the farmer who is growing the crop.

Specialty crop farmers see an economic benefit through increased awareness and ultimately increased consumption of local specialty projects. By focusing on the specific crop of pumpkins through fun and interactive lessons that also highlight where they can be purchased, students are more excited and enthused about attending farmers' markets or going to the pumpkin patch and will get their parents wanting to go as well.

When specialty crops lessons are utilized in IAITC, it results in more than 550,000 students, their parents and siblings, 31,000 teachers and their families becoming a targeted market for increased attendance at farmers' markets throughout the state of Illinois.

Through partnerships with colleges and universities IAITC provided future teachers with information about interest approach topics like specialty crops. Key partners include UIUC, UIS, SIU, EIU, WIU, NIU, ISU, Aurora University, St. Francis, St. Xavier, Chicago State, Northeastern, and the Chicago Teacher Center.

\$2,869 of grant funds supported county coalition grants, which totaled \$524,000. This .5% of grant funding specifically supported lessons and outreach related to specialty

crops. Each coalition received \$42 which in turn reflected the following state-wide results: 37,146 students and 1,403 teachers were reached with lessons related to pumpkins as specialty crops

\$2,494.44 of grant funds supported teacher trainings through the purchase of the “How Many Seeds in a Pumpkin?” Book, which is an extremely popular complementary lesson. More than 300 books were distributed.

Lessons Learned

While there were no unexpected delays in the project, IAITC staff are continually looking to learn how they can grow the program and continue to meet the needs of students, teachers, and the agriculture industry. Some of the biggest shifts during this grant period were the change in learning standards to incorporate Common core and Next Generation Science Standards. IAITC continues to adapt and stay on the forefront of changes so it can continue to be a credible and viable part of the educational platform.

Teachers and students are utilizing resources as quick as they can be printed and stocked. This past school year saw a 3% increase from teachers involved in the prior year. 4,900 volunteers participated as classroom presenters, fieldtrip hosts, as well as advisory board members. This number includes 400 new volunteers to the program, a significant increase. IAITC program numbers will continue to grow as more educational resources are made available for teachers to integrate into the classroom.

Students participating in this program gained a basic understanding about the connection of specialty crop foods and nutrition and health.

Contacts

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Recipient

Southern Illinois University, Carbondale

Project Title

Impact of Novel and Traditional Soil Management Systems on Vine Balance, Water Status, Wine Quality and Soil Health

Background. In Illinois most vineyard managers, concerned for perceived aesthetics by wine tourists and excessive competition of ground cover with grapevines, have intensively applied traditional ground cover management techniques consisting of a bare strip maintained by frequent herbicide use under the grapevines and frequent mowing in the between-row sod aisles. This traditional ground cover management applied to typical vineyard sites on erodible slopes frequently creates serious soil loss under vines and poor soil structure. This project sought to address three aspects of the emerging vineyard soil management problem: 1.) effectiveness of new cultural and biological under-vine management tools, such various mulches, compost, and fertilization, 2.) grower reluctance to adopt new soil management methods, and 3.) value that consumers place on sustainability of vineyard cultural practices.

Importance and timeliness. The majority of vineyard acreage is now susceptible to serious erosion problems and subject to declining productivity if the soil surface is not improved. Reversing declining productivity is critically important in the state where average statewide yields fell from 2.74 tons/acre in 2006 (Shoemaker, 2006) to 1.4 tons/acre in 2011 (Ward, 2011). The gross revenue produced by the average yield in 2011 (1.4 tons/acre x \$993/ton = \$1,390/acre) was actually insufficient to cover the estimated \$2,831/acre operational costs (excluding fixed costs, e.g. equipment and land) for the year (Wolf, 2008). Successful establishment of a new ground cover management system can protect soil structure and health in a sustainable manner, increase grower adoption of sustainable vineyard production, improve wine quality, and connect wine quality to sustainable viticulture practices thus providing a unique opportunity to improve the competitiveness and marketing of the industry to regional and national consumers.

Enhancement of previous specialty crop work. A previous project SC-12-13 evaluated the a wide range of cover crops for suitability in Illinois vineyard setting and explored methods of establishing and maintaining cover crops in a deep moderately fertile soil.

Project Approach

Activities. The project focused on the research site that was selected in Union county, Illinois, because its mature vineyard (planted in 2006) exhibited eroded soil in dripline area under vines and because vines had low capacity (cane length and weight) and yield. The investigators had assumed that the vineyard would respond quickly to the treatments imposed. Five ground cover treatments were applied to the vineyard as main plot treatments:

- 1) grower control – mown fescue aisles and herbicide maintained bare strip in dripline;
- 2) mow and throw – fescue clipping from aisle transferred to dripline;
- 3) red fescue – a less competitive, fine leafed fescue sown in aisle and dripline;
- 4) successional – season adapted cover crops (fall- cereal rye, spring and early summer – spring oats, summer – sorghum-sudan grass), no-till drilled in aisle after previous cover crop was mowed and transferred to the under-vine dripline area;
- 5) compost – a two-inch deep layer of 2 parts splintered hardwood wood chips to 1 part composted grape pomace. Two split plot treatments (0 and 60 lb. N/acre) were also assigned to the vines. Treatments were applied in a randomized complete block design with five replications.

Minimal response to treatment after the first year alerted the investigators to greater problems with the site than the application of ground cover treatments and N fertility rates as outlined in the project, could solve. Foliar and soil test responses revealed low P and soil pH values and marginal K levels. The soil available Al-levels were alarmingly high (from 10 to 1000 ppm), at levels previously reported to be toxic to roots.

Therefore soil amendments were applied to the experimental plots to correct the imbalances in mineral nutrients based on our interpretations. The prescriptions for remedying the mineral nutrient deficiencies (0-46-0 and 0-0-60 fertilizer amendments) and available Al excess (gypsum) were developed for each of the five blocks (in the randomized complete block design), based on its soil test results. These modifications were judged necessary in order for the grapevine experimental units to be responsive to the ground cover treatments imposed.

In 2014 the yield (overall experimental mean) was 0.9 tons/acre from the experimental site compared to 4.36 tons/acre anticipated from a viticulturally sound vineyard (Dami, 2005). Further, the vine capacity, measured by the vine size (weight of dormant pruning), to provide photosynthate in support of crop maturity and perennial vine health was only 1.6 lb/vine, compared to the viticulturally sustainable 5.6 lb/vine recommended by Midwest viticulturists (Dami, 2005). The ground cover treatments (main plot) had no effect on vine response in 2014, but the 60 lb/acre split plot nitrogen treatment marginally increased specific leaf area and midday water potential by 5% during a drought period in late summer. The successional required some additional input with 3 passes of no-till drill per year (Appendix 3). However the compost treatment required the greatest investment in accessing, transport, mixing and spreading the compost (Appendix 4).

In 2015 the overall response of vines to the vineyard environment was improved, but still remained weak. The average crop size across all treatments was still only 1.68 tons/acre or 48% of viticulturally sustainable yield. The vine capacity was only 2.67 lb/vine or 38% of viticulturally sustainable yield standards. Although ground covers provided soil protection in 2015 (Appendix 2), they had minimal impact on yield.

The weak vine capacity, low crop size and marginal or nil response to treatment in 2014, did not position the project for achieving all its objectives. Therefore the focus of the project became vine and cover crop response to treatment and other objectives have been delayed until 2017 in the continuing specialty crops project, SC-16-26, that continues with the research plot. The value of waiting to investigate these objectives until the basic soil chemistry had been adjusted and then impacted vine growth, was made clear by the 2016 vine results.

In 2016 the full impact of basic viticulture care provided by the researchers over the previous two years was clearly evident where the control plots produced 3.4 times greater yield than the experiment mean in 2015. The approximately 5.8 tons/acre yield of control vines would be expected to produce a \$ 5,760/acre farm gate revenue that was 2 times the annual operational cost per acre (Wolf, 2008). Furthermore vine response to cover crop and N fertilizer treatment was finally evident where the mow and throw and successional treatments produced 24 %

greater yield: 7.2 tons/acre (\$ 7,150 farm gate revenue/acre), which was 2.5 times operational costs (Appendix 5). The red fescue treatment produced 13 % greater yield than control.

The tremendous yield increase in 2016 was due to increases in both average cluster weight and cluster number per vine. We predict that vine size response to treatment in 2016 (to be measured at dormant pruning time in March 2017) could be considerably different because the excessive rainfall of 2016. The 38" of cumulative rainfall during the growing season from April to October probably maximized fruit set and cluster size for 2017 because of the meticulous canopy management done in 2016.

Ground cover efficacy. The ground covers that had the most pronounced effect on the dripline area of the vineyard floor space compared to the control (standard herbicide bare dripline), were the successional, creeping red fescue and compost treatments (Appendix 2). These three treatments effectively protected the dripline soil from deleterious erosion and loss of structure in the surface layer of soil (Appendix 6). Respectively, the successional cover crop and both the red fescue and compost treatments reduced the area of bare soil under the vines by about 77% and 98% proportionately to the 70% of soil area that was bare under the control vines. The compost and successional treatments provided the least weed competition compared to the control.

Extensive data (Appendix 7) were collected to allow interpretation of the reasons for the responses of crop and vineyard floor characteristics. These data will also provide indication of the reliability of treatment impact on vine and vineyard floor response in future seasons.

The data collection and interpretation were conducted by the PhD graduate assistant Sarah Bowman with the aid of undergraduate student workers for the duration of the project. Further multivariate analyses of these data will be conducted to measure impact of treatment on vine cover crop and nematode community under the support of SC-16-25.

Conclusions

Selective use of cover crops and compost mulch can increase grapevine yield by almost 25% (2016 results) and prescription N application can increase yield by at least 10% in a year when rainfall was plentiful. These results demonstrate potential for significant positive impact of cover crop or mulching systems on commercial revenue generation potential.

However basic viticulture inputs that brought about the biggest gains in vine performance, focused on amending soil (reducing mineral nutrient deficiencies and reducing Al availability coupled with timely, meticulous canopy management, which produced a roughly 6 fold increase in yield and estimated 3 fold increase in vine capacity over the 3 growing seasons since the project began. In 2016 these basic management inputs moved the vineyard production to a significant level of sustainability (2.5 x annual operating costs, Wolf, 2008) from its previous condition where potential revenue generated from crop in 2014 and 2015 was only 32% and 59%, respectively of annual operating costs reported for commercial vineyards.

The cover crop treatments also provided important opportunities to reduce erosion improve soil moisture budgets and reduce dependence on pre-emergent herbicides. The economic value of these advantages is more difficult to define for growers. However it remains difficult to convince growers to improve management strategies because of strongly held traditional concepts about viticulture practice.

Even progressive grape growing operations are missing opportunities for improving revenue generation, cash flow and profitability because of failure to identify and focus on strategies and tactics that will optimize a balanced-vine capacity for each vineyard block. Additional focus on site preparation e.g. liming for pH adjustment and subsequent plot maintenance and soil and foliar mineral nutrient analyses could have increased revenue generation in the current experiment tremendously.

Thorough analyses of the interrelationships of all data collected in the current project should provide a platform to develop a convincing case for grower adoption of our recommendations. Initial calculations of the benefits to growers based on recommendations developed from our project results are profound (see Goals and Outcomes).

Unusual developments.

The two-year delay in bringing the experimental vines to an economically viable vine capacity and crop size threshold, delayed the opportunity to collect meaningful data about grower and consumer evaluation/adoption of our cover crop research results and recommendations.

Therefore these data will be collected under a succeeding specialty crop grant in 2017.

Recommendations.

Illinois grape growers should be encouraged to adopt a vineyard management strategy that pushes to maximize vine capacity to the limits of each vineyard site. Growers who chose to invest in developing an optimized balanced capacity will move from an economic struggle to survival to a profitable enterprise. In order to implement the optimized vine capacity strategy growers must be willing to learn new ways of tracking vine growth response to its environment. They will also need to modify very traditional basic assumptions about vineyard management.

The key tactics for applying an optimized vine capacity strategy are:

1) Basic vineyard capacity – anticipated benefit of 2.25 times increase in yield

- Careful attention to site evaluation and preparation prior to planting vineyard to address specific site vulnerabilities;
- Focus on setting vine capacity goals early in life of vineyard;
- Frequent monitoring of indicators/predictors of vine capacity driers, e.g. shoot length, tendrill exertion, pruning weight and foliar and soil mineral nutrient analysis;
- Meticulous canopy management.

2) Vineyard floor management – anticipated benefit of 10 to 25% increase in yield

- Adoption of “grow your own” dripline mulching systems, e.g. mow and throw, successional or compost. Additional benefits from reduced post-emergent/pre-emergent herbicide use and reduced selection pressure for development of herbicide resistance may also accrue.
- Use of red fescue as dripline cover may be warranted in vineyards located on moderate to high fertility soils where managing excess vine capacity was a problem (previous project has measured up to a 30 % reduction in vine vigor where ground covers are competitive with vine growth in May, June and July). Use of creeping red fescue will require adaption of a pre-

emergent herbicide program that is compatible with maintaining a healthy red fescue sod to prevent invasion by problematic weed species.

3) Optimizing vine N-fertilization program – anticipated benefit of at least a 10% increase in yield on low fertility soils

- Base N-fertilization rate on actual vine size and recommended target;
- Use of split applications of annual N-fertilizer prescription.

Specialty crop focus

The project focused solely on research and outreach in a wine grape vineyard and thus the project could not benefit commodities other than specialty crops.

Contributions of project partners.

The project partner, the Illinois Grape Growers and Vintners Association, a state-wide industry trade organization provided the venues and publicity for the presentations of the research results and their practical applications for commercial grape growers.

Goals and Outcomes Achieved

Activities to complete performance goals. The activities performed in this demonstration research project were carried out to meet its four stated goals, but the impact of non-treatment environmental stress, specifically low soil pH, low P and K and high available Al and shallow topsoil on this previously eroded site, was seriously underestimated and unknown at the beginning of the project.

The activities performed to achieve each goal are summarized below. **Goal one: Application of vineyard floor management treatments and application of N fertilization.** This goal was supported by activities focused on experimental treatment application. Activities completed to meet goals of the experiment are outlined below. 1.) search for and identification of sites to conduct the experiment. A mature block of 'Norton' was found in a commercial vineyard in

Union County, Illinois. A comparable 'Norton' vineyard for test in central Illinois was not found. Therefore a second site involving mowing frequency was investigated for impact of soil health in 2015/2016 at the Horticulture Research Center at Southern Illinois University at Carbondale (Jackson County). 2.) In early 2014 initial vine capacity (vine size) was measured at the Union County site. Soil chemistry was tested. 3.) Experimental vines were assigned to blocks based on vine capacity prior to experimental application. 4.) The vineyard floor cover experimental treatments were assigned at random within blocks. 5.) Split plot treatments (0 or 60 lb N/acre) were applied as banded treatments in sequential split applications at bud burst, fruit set and veraison. 6.) Canopy management operations (shoot thinning, shoot combing and lateral shoot removal) were applied in May, June and July. 7.) Yield and fruit composition data samples were collected from each experimental unit immediately prior to (1 day before) commercial harvest and fruit chemistry was subsequently tested. 8.) In February of 2015 the vine size pruning weights were collected. Subsequent analysis of yield and vine capacity revealed very low yields and vine size. 9.) Investigation of the poor performance and minimal response to treatment revealed soil nutrient imbalance and Al at toxic levels. 10.) Owing to poor vine response, efforts at grower and consumer education were postponed because impact of grapevine response to experimental treatment could not be demonstrated. 11.) Remediation (gypsum, P and K fertilizer) of the site based on extensive soil testing and literature review was conducted in spring of 2015. 12.) Viticultural operations and data collection were continued in 2015 and 2016 as per description in steps 3 through 8 above. Vine response to mediation was strong by 2016 allowing achievement of the goals of testing vineyard floor management and two N fertility levels as split plot.

Goal two: Identify analyses and practical grower tools that could be used by growers to monitor vine and soil health. Currently our results and survey of literature indicate that increase in vine size (pruning weight) parallel increases in yield from 2014 to 2016. Other variables investigated include mid-day water potential and foliar nutrient content at bloom and veraison. Veraison foliar nutrient content and vine size and crop size measurements support end-of-season grower assessment of novel ground cover treatments. Foliar nutrient analyses

have the advantage of indicating vine response early enough in the season to allow for remediation during the same season. Further analyses on these monitoring tools will continue once remaining data are collected, e.g. 2016 vine size will be measured in February 2017 during dormant pruning. Because the novel cover crop treatments change the plant community on the vineyard floor, further comparisons between the vineyard cover and its impact on soil health is needed. Fortunately continuation of this project under SC-16-25 is allowing us to measure nematode colonizer-persister index as a bio-indicator of soil health.

Goal three. Educate growers on sustainable practices for vineyard floor management. On July 11, 2015 [twenty growers](#) toured the research site and listened to an explanation of novel treatments and preliminary results. Subsequently on February 27, 2016, Sarah Bowman, SIUC PhD student, presented “Impact of Ground Cover Management Systems on Vineyard Productivity, and Water and Nutrient Relationships” to 40 growers from across the state at the Illinois Grape Growers and Vintners Association (IGGVA) annual meeting in Springfield, IL. On February 24, 2017, Sarah will present the analyses of vine response to novel cover crop treatments to the IGGVA annual meeting. **An additional fifty growers are anticipated to attend the conference. An outreach bulletin has been drafted (see attached first draft). A revised draft will be distributed at the IGGVA Annual Meeting on Feb. 25, 2017). A survey will be conducted to determine grower adoption of these practices at the annual meeting as well. Therefore these vineyard floor management practices developed from our project will have been delivered to 110 growers by end of February 2017.**

Goal four. Educate consumers about grower use of sustainable vineyard floor management practices. Assessment of consumer attitudes regarding sustainable vineyard practice and education about grower efforts in adopting novel ground cover treatments have been delayed until 2016 data analyses are complete and initial analyses of soil health conducted with the support of SC-16-25 are available. **These resources will be developed in the 20017 season.** Progress on long term outcomes. In 2016 project progress currently suggests that all four novel vineyard floor management treatments substantially (13 to 24 %) increased yield compared to

the grower control (Appendix 5). Achieving these yield increases while also increasing vineyard floor cover to prevent erosion and improve weed management indicates the potential usefulness for grower applications. However these potential increases in yield are much smaller than the overall increase in yield caused once deficiencies in both basic mineral nutrient availability and toxicity and previous canopy management, were corrected. In 2016 the yield of control was 3.4 and 6.4 times the yields of 2015 and 2014, respectively. The 2016 results strongly suggest the advantages of adopting the novel ground cover management treatments as grower practice, but the large increases in yield from 2014 to 2016 resulting from basic corrections of vineyard site deficiencies, were so much greater. Therefore it is prudent to validate 2016 results by continuing the experiment in 2017. Fortunately the experiment will be continued because of funding from a subsequent specialty crops grant, SC-16-25.

Major successful outcomes. The project has demonstrated the suitability of the novel ground cover treatments in improving yield by 10 to 25 % and dramatically increasing soil protection with increased coverage of the soil surface while reducing weed management inputs. Unexpectedly the project demonstrated the added benefit of correcting deficiencies in soil mineral nutrient levels, and reducing Al availability. These corrections increased vineyard yields in 2014 from 0.9 tons/acre to 1.68 tons/acre and 5.8 tons/acre for 2015 and 2016, respectively. If Illinois vineyard yield could be increased by ½ of the 4.5 x increase measured from 2014 / 2015 to 2016 in the current project, the state's yield average of 2.07 tons/acre from 2006 to 2011 (Shoemaker, 2006; Ward, 2011) would have increased to 4.66 tons/acre, resulting in approximately \$ 2,150,000 increase in annual revenue for growers, which would translate to at least a \$ 14.33 million increase in wholesale value of Illinois grown wine.

Beneficiaries

Approximately 175 commercial vineyards (1,107 acres) in Illinois (Ward, 2011) stand to potentially benefit from the identification of suitable novel ground cover treatments from the current project. An additional 136 hobby vineyards (41 acres) could potentially benefit as well. The 175 commercial vineyards employ 128 full-time and 165 part-time people. An additional

700 seasonal employees were supported during dormant pruning, canopy management and harvest operations. Based on the estimates provided in the previous section modest adoption of improved soil and ground cover management tactics as demonstrated in the correction of basic vineyard management deficiencies in the current project potentially could increase vineyard yields substantially.

Lessons Learned

The project demonstrated that a major reason for growers to cling to traditional, informally selected vineyard floor management strategy is that the vine's response to vineyard inputs is not immediate. Vine response to change in vineyard floor management took at least two years in the current project. The slow vine response to treatment clearly demonstrates the need for long term research in vineyard management in the state. It further demonstrates the need for developing grower appreciation for the results of these long term research projects because it is unlikely that growers have the resources to invest in individually in research on long term ground cover alternatives. The most significant unexpected outcomes of the project were the long delay in vine response to correction of basic vineyard management deficiencies and then ultimately the large scale response to the amendments used to correct these deficiencies.

Goals not achieved. So far goal three has been only partially achieved and goal four has not been achieved. These shortcomings were caused by the absence of substantial responses to site deficiencies and treatment application in 2014 and 2015. Proposal development for the current project should have anticipated the slow vine response to treatments applied to the vineyard floor and therefore limited the current project to goal one and two because of the long-term nature of grapevine response to vineyard floor management treatments.

Positive experiences. Despite the lack of fulfillment of project goals three and four, the current project positioned the investigators to capitalize on its initial remediation of basic vineyard deficiencies and initial response to novel ground cover treatments in order to access SC-16-25 support. The support provided by SC-16-25 will allow completion of goals three and four and it will allow expansion of the objectives of validation of treatment response and increasing opportunities for educating growers about the dramatic advantages in improving basic vineyard

management deficiencies. The results anticipated in the execution of SC-16-25 will increase grower confidence in the validity of vineyard response measured in the current project (SC-14-31).

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Additional Information

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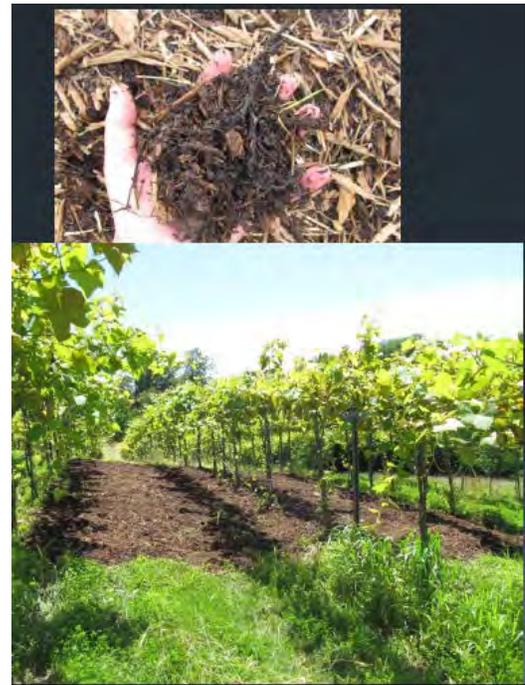
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Appendix 2. The range in soil surface protection of the under canopy dripline provided by (left to right) herbicide bare strip (grower control treatment), cereal rye (successional treatment), creeping red fescue treatment and the wood chip/grape pomace compost treatment. Note the complete soil surface cover of the three novel vineyard floor treatments compared to the cracked, crusted and bare surface in the traditional grower standard control.



Appendix 3. Use of no-till drill was critical to providing uninterrupted soil surface protection while still ensuring emergence of the next season's cover crop in the successional treatment. Note the excellent mulching effect provided to dripline area under the vine canopy with the cereal rye residue raked from the aisle in early June.



Appendix 4. While mixing (top left) of the wood chips and composted grape pomace (top right), and the distribution (bottom left) of resulting mix required extensive labor for the research trial, mechanization for grower scale application could minimize the extra costs of the compost mix application. Note the excellent soil cover provided by the treatment (bottom right).

Appendix 5. The response of mature Norton vine yield components to cover crop and nitrogen fertilizer treatments estimated by lag phase sampling in 2016.

<u>Groundcover</u>	<u>Cluster number</u>	<u>Avg. Cluster size (lb)</u>	<u>Yield as % of control</u>
Control	140	0.140	100
Mow and throw	150	0.162	124
Red Fescue	160	0.144	113
Successional	160	0.152	124
Compost	150	0.156	122
<u>Nitrogen</u>			
None	150	0.144	100
60 lb/acre	150	0.156	110

Appendix 6. Vineyard floor response in dripline under grapevine canopy to cover crop and nitrogen fertilizer treatments.

<u>Groundcover</u>	<u>Groundcover Rating at Bloom (May 2016)</u>		
	<u>% Bare soil</u>	<u>Groundcover index^z</u>	<u>Weed index^y as % of control</u>
Control	70	0	100
Mow and throw	65	0	100
Red Fescue	3	220	990
Successional	16	1600	33
Compost	0.3	110	6
<u>Nitrogen</u>			
None	13	30	100
60 lb/acre	11	35	62

^z Groundcover index = % groundcover x height of groundcover.

^y Weed index = % weed cover x height of weed cover.

Appendix 7. Data collected for each experimental unit over course of the experiment.

<u>Vine</u>	<u>Soil</u>
Specific leaf area	Bulk density
Leaf and petiole mineral content	Compaction (soil strength w/ penetrometer (0-16"))
Leaf chlorophyll content	Macros, micros, pH
Vine water potential	CEC, OM
Vine periderm rating	Soil water content
Cane density	
Cordon length	
Vine pruning weight	
<u>Crop</u>	<u>Ground cover</u>
Yield (lb/vine)	- dripline
Cluster weight	- aisle
Cluster size	- tread
50 berry weight	Rating at bloom, veraison and harvest
	Weed species census
<u>Fruit composition</u>	Height
Brix	% cover
pH	Biomass
Titrateable acidity	
Berry phenolic composition	

Guide to Vineyard Floor Management Systems for Illinois*

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Introduction

It is unfortunate that selection of ground cover management systems for a specific vineyard is often by default, because growers can profit by matching characteristics of site and vineyard goals with vineyard floor management systems. Important variables include phase of vineyard development, soil texture, structure, depth and fertility, surface slope and aspect and rainfall patterns, and the nature of the grape variety grown. There is no one management system that is perfectly suited to every management situation. Selection of vineyard strategy should be informed by the most critical variables that protect the soil environment and support quality production and plant health over the life of the vineyard.

Site preparation

The top priorities during site preparation are reducing annual and perennial weeds, stabilizing soil structure, adjusting soil fertility and pH and reducing pathogens (Table 1). The degree of success with the strategies and tactics recommended to accomplish these goals depends on the initial soil texture and structure of the site. Soils that have been previously heavily tilled or eroded will require more intensive intervention (use of higher tonnage cover crops and deep tillage) than lighter textured or better structured soils (e.g., fescue sod or no-till row crops for several years prior to site preparation). Use of grow-on-site cover crops is generally more suitable and cost effective than use of mulch imported to the site. However one must supply mineral nutrients and employ prescribed rate, depth, timing and method of drilling to gain benefit from the cover crop. “Cutting corners” in establishing cover crops will provide little benefit from their use; therefore meticulous soil sampling analysis and nutrient and soil pH adjustment prescription is essential (Table 3). Testing soil for nematodes may also be beneficial to indicate damaging populations of plant parasitic nematodes.

*Funding for the project was supplied in part by the Illinois Department of Agriculture through the USDA Specialty Crop Grant Program and Southern Illinois University.

Where problems exist, use of growth and incorporation of bio-fumigants (mustard) may be indicated. Deep tillage during site preparation should be done in the first year during a dry period (generally July through September).

Deep tillage followed by seeding with sorghum-sudangrass (August) or cereal rye (September) will help maintain the benefit of soil loss from tillage by building root channels in the fractured soil to encourage aggregation and “stabilize” the loosened soil. Successful stand establishment will prevent surface erosion and facilitate earlier spring planting once site preparation is finished.

During site preparation care should be taken to prevent weed and cover crop species from going to seed. Preventing seed production can be accomplished by mowing or killing in place with over the top glyphosate or glufosinate herbicide applications to sufficient healthy foliage. If broad leaf perennials (e.g., poison ivy, honey suckle, Virginia creeper, etc.) are present, then the addition of a 2,4-D spray may be indicated provided that it does not pose a risk to surrounding crops. Never apply 2,4-D or related compounds or allow drift of those sprays to areas near existing vineyards or other sensitive crops. Tillage several times through the season may also reduce annual weed “seed bank” and increase susceptibility of perennial weeds to elimination with herbicides.

Vineyard establishment

Rapid establishment of thrifty vines during the first two years after planting is essential for development of vineyard production potential and eventual profitability. Stimulating healthy, strong (3 to 5 shoots with ~4” internode length), but not rank (5” to 6” internode length) shoot growth, is essential for successful vine establishment (Figure 1).



Figure 1. Grapevines under severe (left), moderate (middle) and no (right) water stress at end of first season of growth.

The establishment phase is the only time in the life of the vineyard that thorough elimination of competition is necessary. The low ability of newly planted vines to establish in competitive environments justifies the use of moderate to severe weed control measures. Use of less competitive cover crop species, close mowing, mulch and even short term cultivation will speed establishment of newly transplanted vines. Even though these more severe control measures will effectively reduce weed competition around young vines, they must be used with sound judgment.

Planting cover crops near young vines will reduce their growth, so at least a 3' diameter weed and cover crop free zone must be maintained around each vine where cover crops are used. Cover crops that grow during the fall, winter and early spring will protect the soil and cause no harm to dormant vines so long as the cover does not encourage wildlife depredation. Care should be exercised in using close mowing and mulch. Close mowing against vine trunks will cause crown gall and loss of the vine. Mower/weed eater "blight" is common where managers are inexperienced, afraid of using other technologies or are not keen observers of plant response. We have seen growth suppression of even mature vines where only 1 -2" incompletely composted mulch was applied under vine. Use of straw, hay or wood chips will support a nitrogen hungry population of microbes that will easily out-compete the young vines for nitrogen source. Cultivation can also be misused. Deep, close-to-vine cultivation prunes an already weak root system. Contact with large roots, crowns and trunk will also produce crown gall. Frequent cultivation will destroy soil structure and root access to essential oxygen in wet periods and water during dry periods.

Almost all of the problems associated with prudent application of the severe methods of competition control can be greatly reduced with generous use of vigorous cover crop species during the site preparation phase. From our experience we have found that residue from deep, extensive fibrous root systems developed by sorghum-sudangrass and cereal rye can support young vine growth and protect the soil for 1 to 2 years afterward.

Preventing rutting and compaction from equipment and foot traffic is necessary during vineyard establishment. We have observed weakly growing vines and increased winter injury and crown gall where water stands near vines in ruts and low spots created during establishment. Therefore light grading to raise row elevation slightly above the adjacent aisles during site preparation with a moldboard plow, disk harrow (adjusted to raise a center ridge) or a "rice ridger" can virtually eliminate standing water issues as long as drain ways across ridges at the low elevation of drainage patterns are left to prevent ponding in aisles. Subsequent sowing of thrifty temporary cover crops in dripline area of future rows and establishment of dense permanent sod (Table 2) in row aisles, will maintain the established surface drainage patterns and help support vineyard traffic during wet periods.



Figure 2. Repeated herbicide application (left), cultivation (middle) or low mowing of sod or resident vegetation will lead to loss of soil structure, standing water near vines and surface erosion (right). Annual establishment of cover crops will prevent these deleterious effects.

Mature Vineyard

Supporting vineyard traffic and preventing erosion are the first priority fundamental goals (Table 1) for managers to achieve as vines approach full crop and canopy development. In most cases these goals should be achieved gradually during the vineyard establishment phase and then maintained during the mature phase. Most problems develop when these goals are not addressed or when cover crop and sod species are used that are not adapted to the soil or climate of the site. Excessive use of herbicide bare strip culture where no ground cover is allowed to develop during the entire year (Figure 2) or repeated close mowing will also cause serious problems achieving soil support and erosion goals.

Maintaining ground cover and building soil organic matter help maintain soil structure. Maximizing water infiltration rates is important in mature vineyards because of the high vine water use rates of full canopies laden with fruit. Also in summer when water deficits are likely, rainfall usually comes as short intense thunderstorms. Maintenance of healthy sod in aisles and intermittent use (in fall and winter) of cover crops and resident vegetation (in spring) in the dripline, will build and maintain soil structure and increase water infiltration rates. In vineyard aisles we have measured a doubling in rates of water infiltration where complete soil cover or mulch protected the soil surface as compared to sparse cover with puddled soil surface. We anticipate greater problems with compromised water infiltration in fine textured clay and loam soils on sloping sites.

The cover provided by managed aisle and dripline vegetation will also reduce problems with annual and perennial weeds. Incorporating herbicide use in these management strategies requires an increased understanding of their interactions with residue and growing plants on the soil surface, especially in the dripline.

Managing vine vigor in association with healthy, effective vineyard floor covers can be challenging if the effects of these interactions are not anticipated. For example application of incompletely composted mulch having a high C:N ratio (straw, corn stover, wood chips, etc.) will rob nitrogen and can stunt the vine. In contrast, a fully composted mulch with a high C:N ratio (manures) can increase nutrient availability and promote excessive vine vigor.

Managing living sod in aisle and intermittent covers in dripline with prescribed N-fertilizer applications and strategic mowing or burn down with herbicide as appropriate can increase the control over vine vigor.

Table 1. The three phases of goals, strategies and tactics for vineyard floor management to achieve high quality, sustainable production.

Phase	Goals	Strategies	Tactics
Site Preparation	Reduce annual and perennial weed seed bank	Tillage and row crops	Adjust crop schedule for soil amendment, prevention of weed seed production, e.g. timely tillage, Glyphosate read crops for 3 to 5 years pre-plant. Avoid pre-emerge herbicide with long residual
		Tillage and cover crops	Match species with objectives for site.
		Increase vine vigor	1.) Herbicide bare strip 2.) Burndown herbicide with grow tubes 3.) Mulch barrier
	Support vineyard traffic	Permanent sod in aisles	Maintain durable species, e.g. tall fescue with moderate fertility and mowing.
	Prevent erosion	Permanent sod in aisles. Only use moderate herbicide bare management in dripline	Maintain durable species, e.g. tall fescue with moderate fertility and mowing. Delay contact herbicide application until aisle has cover. Seed cereal rye in dripline in fall.
	Maintain soil structure	Manage aisle and dripline for complete soil cover	Maintain durable species, e.g. tall fescue with moderate fertility and mowing. Delay contact herbicide application until aisle has cover. Seed cereal rye in dripline in fall.
	Increase water infiltration and nutrient ability	Manage aisle and dripline for complete soil cover	Maintain durable species, e.g. tall fescue with moderate fertility and mowing. Delay contact herbicide application until aisle has cover. Seed cereal rye in dripline in fall.
	Minimize annual and perennial weeds	Manage aisle and dripline for complete soil cover	Maintain durable species, e.g. tall fescue with moderate fertility and mowing. Delay contact herbicide application until aisle has cover. Seed cereal rye in dripline in fall.
	Reduce vine vigor	Increase cover crop competition. Reduce vine N application	Reduce mowing frequency. Delay herbicide application. Apply 0 to 30 lb N/acre to vine.
	Increase vine vigor	Reduce cover crop competition. Increase vine N application.	Increase mowing frequency. Apply 30 to 60 lb N/acre to vine.

Table 2. Establishment requirements for annual and perennial cover crops useful in Midwest vineyards.

Season and Species	Planting Time & Depth	Seeding Rates lb/acre	Nutrient requirements	Management issues
Annual Winter wheat	Aug-Oct. 1"	100-150	Site prep: 30-90 lb N/A Est. Vineyard: half rate	Use weed free seed. Mow or kill in spring before >1 ½" tall or vine growth starts.
Annual Cereal rye	Aug-Nov. 1"	100-150	Site prep: 25-50 lb N/A Est. Vineyard: half rate	Very vigorous grower. Do not allow seed to mature. Suppress or kill before spring vine growth starts.
Annual Spring oats	Feb-June 1"	100-150	Site prep: 30-90 lb N/A Est. Vineyard: half rate	Use at site preparation and temporary aisle stabilization.
Annual "Tillage radish"	Fall or Spring ½-1"	20-40	Site prep: 25-50 lb N/A Est. Vineyard: half rate	Perceived benefits often exaggerated. Can be very competitive with young or mature vines.
Annual Sorghum-sudangrass	Warm season (>50° F) 1-1 ½"	35-70	Site prep: 25-100 lb N/A Est. Vineyard: not recommended	Useful for site preparation. Builder of soil structure. Tolerant of drought and low fertility soil if N source supplied. Susceptible to low pH soils (high Al levels) Rank growth on fertile soils. Must be managed with repeated mowing
Perennial Turf-type Fescue blend	Fall and overseed in Spring 1"	150-200 Overseed: half rate	Site prep: 30-90 lb N/A Est. Vineyard: half rate	Establish as aisle cover post site preparation. Drought and moderately heat tolerant. Must provide fertility and overseed as needed to maintain dense soil cover. Mow to height of 4" every 2 to 4 weeks depending on available soil moisture.
Creeping Red Fescue	Fall and overseed in Spring 1"	150-200 Overseed: half rate	Site prep: 30-90 lb N/A Est. Vineyard: half rate	Establish as aisle cover post site preparation. Susceptible to drought and heat. Establish as dripline row cover ONLY IN MATURE VINEYARD with separate cover crop and vine fertility program. Must provide fertility and overseed as needed to maintain dense soil cover. Mow to height of 4" every 2 to 4 weeks during cooler months of spring and fall.

