



**Specialty Crop Block Grant Program
(SCBGP)
FFY 14
14-SCBGP-IL-0017**

Final Performance Report

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

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December 2017

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

SC-15-01

Project Title: Illinois Specialty Crops, Agritourism, and Organic Conference – January 2016

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, Mariah Dale-Anderson, Chuck Voigt, Nathan Johanning, Steven Ayers, Andrew Larson, Jeff Kindhart, Shelby Henning, Mike Roegge, 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 Farmer Today*, *Illinois Times*, county Farm Bureau managers, Extension service, Master Gardeners, 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, 2015. 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 broke attendance records this year and were very pleased with the interest that this conference continues to maintain.

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. 2017 conference planning will take into consideration suggestions gleaned from the 2016 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 2015 attendance: The number of participants who attended the conference increased 11% from last year. Conference attendance normally ranges from 600-675 but this year we were just shy of 700.

Increase trade show attendance by 5%, measured by an increase of exhibitors measured through our attendance comparison report. This year we sold 71 trade show booths (vs 64 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 2016. 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 29 new members to the Illinois Specialty Growers Association as a result of promoting membership at the conference.

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 19,000, and we continue to see the largest jumps in "hits" during the months preceding the conference.

Provide programming for producers regarding "Good Agricultural Practices," which will provide assurance to the consumer that their produce is safe. The program planning committee elected not to have a full-day workshop on this topic but instead intermingled food safety programming throughout the three-day event in various educational tracks.

Increase number of participants attending a Pesticide Safety Education Program (PSEP). Because this goal and grant request was written two conferences in advance of the actual 2016 conference, the originator of this program (University of Illinois) discontinued offering this program in conjunction with our conference and went back to their previous format of providing this meeting outside of our venue.

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 80.

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 close to 700 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 75% 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 and need 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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**EXPERIMENTAL STATION
61ST STREET FARMERS MARKET
ILLINOIS SPECIALTY CROP GRANT PROGRAM FINAL REPORT
SC-15-3**

Project Partner Organization: The Experimental Station

Project Title: Increasing Demand Through Educational Outreach 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. 2015 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:

The 61st Street Farmers Market continues to grow and expand both its food and educational offerings.

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. In 2015, 92.2% of the 460 customers surveyed at the Market stated that they come to the Market to purchase fruits and vegetables. 71.2% of customers stated that they consume more fruits and vegetables as a result of shopping at the Market. The 61st Street Farmers Market enjoys a faithful clientele, who attend the Market on a regular basis. 42% of shoppers surveyed reported that they attended the Market 10 or more times from May through October, while 19.6% reported that they have attended the Market since 2008.

In 2015, 32 sustainable family farmers and local food businesses sold at the market. 15 of the Market's vendors sold Illinois Specialty Crops. In addition, five of our prepared food vendors (bakers, crepe and burrito/taco sellers, ice cream/sorbet sellers) used fruits and vegetables sourced from Market vendors.

Overview of Market Food Education

Our new Market Manager, Ms. Kim Werst, did a terrific job this year bringing food education to children and adults in our community. Equally full of enthusiasm and knowledge of how to grow, prepare and preserve fruits and vegetables, she has been a wonderful teacher for all of us. Working closely with Carnegie Elementary School staff, she developed and carried out a hands-on in-school healthy eating and gardening curriculum that built on previous years' curricula by integrating current class studies into

the lessons (e.g. mapping, scientific observation, developing questions and hypotheses). Students and teachers became, in turn, enthusiastic learners. Outgoing and full of ideas, she was able to keep our Market School activities and instruction lively and engaging, and actively employed social media (Facebook, Instagram, Twitter) to provide food education while promoting the Market.

In-School Education

Following several months of planning and coordination with Carnegie School administration and staff, our Market Manager launched our in-school Healthy Eating series. Over four weeks, three classes of 50 Carnegie 2nd grade students learned about the farm to plate supply chain and life cycle of a plant, and together planted chives, peppers and lettuce. After discussing a variety of vegetables the students had not previously tried, students tasted baby lettuces, carrot greens, beets, beet leaves and stems, and soy bean sprouts. In a later lesson, they were shown vermicomposting and learned the importance of soil in the farm to plate cycle. Through a variety of interactive activities, students learned about nutrients in fruits and vegetables, the 5 food groups, and MyPlate. They tasted carrots, bean sprouts, peppers, plums, blueberries, mint and lemon balm.

Much preparation went into the gardening program, with the repair of the hoop house, installation of an irrigation system, preparation of the soil inside the hoop and in the community plots outside the hoop, and purchase and planting of seeds and seedlings to be transplanted in the garden. In May the 2nd grade Healthy Eating course transitioned into the in-school gardening program. Over seven weeks, the 2nd graders benefited from a very interactive and engaging course, which included planting a variety of vegetables (radishes, sweet peas, bush beans, okra, potatoes, sweet potato slips, sweet corn), transplanting seedlings in the hoop house (swiss chard, lettuces, kale, sweet peppers, calendula, turnips and cabbages), dealing with an infestation of roly poly bugs (picking them off and feeding them to our chickens), thinning plants and harvesting (turnips and radishes). In the final spring class, which lasted 2 hours, students reviewed the plants they were growing in the garden/hoop house in preparation for Family Garden Show-Off Night. Among these were: kale, collards, beets, corn, quinoa, sunflowers, potatoes, watermelon, zucchini/yellow squash, beans, basil, onions, turnips, pepper plants. Students located and labeled the plants that they were going to harvest on Family Night. All harvested vegetables were distributed to the children and their families.

The gardening program continued throughout the summer with our Summer Youth Gardening Program. Our Market Manager provided twice weekly classes to 14 youths who harvested, washed, tasted and took home: kale, collard greens, swiss chard, basil, mint, radishes, carrots, green beans, sweet peppers, shelling peas, onions (red and white), cabbage, lettuce, beets, tomatoes, and okra. They also planted pole beans, lettuces, beets, broccoli, cauliflower, romanesco, borage, dill, parsley, peppers (transplanted), mustard greens, and carrots.

As part of our summer education program, the Market hosted Jackson Park Terrace Garden Day on August 23. We purchased late-summer fertilizer and seeds for Jackson Park Terrace residents to sow: spinach, beets, radish, rapini, lettuces and endives. Chef Ramona Baptiste provided a chef demonstration featuring farmers market and hoop house produce: heirloom tomato salsa, wilted greens, cold salads. The 20+ attendees

received Healthy Eating Workbooks (created with previous Specialty Crops funding), learned about seasonality in Illinois and how to harvest, participated in tours of the garden and hoop house and had the opportunity to ask questions about the garden and gardening.

This fall, the in-school education continued with five weeks of in-school gardening for 50 3rd graders and four weeks of in-school gardening for 60 4th graders (who had missed gardening in the spring as 3rd graders). In addition to harvesting vegetables, students learned how to save seeds, saving tomato, radish, sunflower, pepper and bean seeds from the garden. 4th graders subsequently had the opportunity to participate in the fall after-school cooking classes.

The Experimental Station Executive Director and Market Manager organized and oversaw four 3-week series of spring and fall after-school cooking classes for Carnegie School 4th graders. The greater integration of the Healthy Eating and in-school gardening program into the Carnegie School curriculum has resulted in increasing interest among students in learning to cook. A total of 47 students participated in the four 3-week series of cooking classes. Among some of the dishes they prepared were: Tomato, Onion and Cilantro Pico de Gallo, Strawberry Guacamole w/Onions, Tomatoes and Herbs, Asparagus Scramble w/Market asparagus and green garlic, Kale Salad w/Vinaigrette, and homemade yellow tomato sauce, Beet and Sweet Potato Chips w/Autumn Guacamole, Maple Syrup and Cinnamon Cauliflower and Kale Salad w/Apple Cider Vinaigrette, Apples & Pecans, and Sautéed Carnival Squash w/Homemade Marinara and Kale Salad w/Peppers & Apples.

At-Market Education

For the second year, in 2015 the 61st Street Farmers Market was able to run year-round with monthly markets from January through April, our weekly outdoor market from May through October, and our weekly fall indoor market from November through December 19.

On May 16 the Market launched its eighth outdoor season, with 27 regional farmers and vendors selling fresh fruits and vegetables, meats, cheeses, eggs, breads and other bakery items, preserved fruits and vegetables, and prepared foods made with Market ingredients. As in the past, the Market offered EBT/SNAP acceptance and a Double Value Coupon Program, matching SNAP purchases up to \$25 per cardholder per market day. In addition, the Market continued to offer *Eat Up!*, through which we gather health metrics of our participating SNAP customers and reward them with \$5 in 'Health Bucks' to spend at the Market.

The 61st Street Farmers Market itself continues to be an active forum for Market education, at once through our weekly Market School learning opportunities, weekly chef demonstrations and tastings, our new Market Library of recipe books and books on preserving fruits and vegetables, our *Eat Up!* initiative, and our partnership with University of Chicago Medicine's Improving Southside Diabetes.

Market School was a weekly feature of the outdoor market season. This year, Market School volunteers taught a range of topics including how to plant and care for your own fruit trees, how to grow a patio garden, how to grow with water reservoir planters, rethinking consumption of sodas and sugar-sweetened juices, how to treat gardens and lawns with natural fertilizers, how to freeze and can farmers market produce, using herbs in your cooking, how to compost vegetable peels and leftovers, how to incorporate more fruits and vegetables into existing recipes, seed saving, and more.

This season's chef demonstrations and tastings provided a diverse array of recipes featuring locally grown fruits and vegetables sold at the 61st Street Farmers Market. Each Saturday, Chicago chefs—many from the South Side—taught 15-25 Market customers how to prepare a seasonal recipe and offered a taste of the dish along with the recipe. A few of these were: Easy Spring/Summer Salads and Dressing Ideas (w/arugula, strawberries, salad greens, zucchini, blueberries); Seasonal Vegetarian Sandwiches; Sesame Watermelon Salad w/Spinach and Summer Squash w/Raspberry Vinaigrette; Easy and Quick Pickled Carrots and other summer vegetables; Seasonal Grilled Summer Vegetables & Quinoa Salad; Salad w/Tomatoes, Peaches and Sweet Corn w/Peach Jalapeno Dressing; Kale and Apple Smoothie; Cabbage Chow Chow Relish w/Peppers and Sweet Corn; Roasted Tomato Cobbler w/Hollandaise Sauce.

Our *Eat Up!* initiative has provided an excellent opportunity, not only for the Experimental Station to collect health data of our SNAP customers, but for our SNAP customers to learn more about their health and about how the fruits and vegetables sold at the Market benefit them. In 2015, the Experimental Station hired staff to implement *Eat Up!* at the 61st Street Farmers Market and at four additional Chicago markets. Customers were encouraged to track their health data from week to week and received information about which fruits and vegetables sold at the market are beneficial for lowering blood pressure.

Via social media, our Market Manager very effectively continued to provide food education on an ongoing basis throughout the week, offering seasonal recipes, information on preserving fruits and vegetables, information about our fruit and vegetable farmers, and nutritional information focused on the fruits and vegetables sold at the Market.

Goals and Outcomes Achieved:

1) Through our educational efforts, we expect that at least 90% of local children and youths participating in our in-school workshops and after-school cooking classes will gain increased knowledge of the nutritional benefits of consuming fruits and vegetables on the Illinois Specialty Crop list. This % is based on 2013 survey responses, where 89.4% of students reported having gained increased knowledge.

86% of youths participating in our Spring in-school workshops and after-school cooking classes reported increased knowledge of the benefits of consuming fruits and vegetables (all focused on Illinois Specialty Crops); **73%** reported that they tried new fruits and vegetables as a result of the class.

2) We expect that at least 90% of 4th graders participating in our cooking classes will increase their preparation and consumption of Illinois Specialty Crops. This % is based on 2013 survey responses, where 94% of 4th graders who took the cooking classes reported consuming more fruits and vegetables as a result of taking the cooking classes.

In the survey from the Spring after-school cooking classes, **91%** of the students reported eating more fruits and vegetables since taking the cooking class; **54.5%** noted that they had tried to cook at home in the course of taking the cooking class.

In the survey from the Fall after-school cooking classes, **100%** of the students reported eating more fruits and vegetables since taking the cooking class; **76%** stated that they had cooked at home since taking the classes.

3) We expect that, as a result of participating in our gardening program, 100% of the youth and adult participants will report an increase in their consumption of vegetables and in their understanding of how vegetables grow.

100% of participants in our Spring gardening program did indeed report an increase in their consumption of vegetables (among them: kale, potatoes, lettuce, beets, turnips [‘turnhips’], herbs [‘hurbs’], broccoli, bell peppers, green beans....). **75.7%** in our Fall gardening classes reported wanting to eat more of the foods they had learned about (among them: tomatoes, kale, cinnamon basil, greens, strawberries, cucumbers [‘cute combers’], black cherries, squash), 18.9% said ‘No’, while 5.4% did not answer the question.

100% of participants in our Spring gardening program reported an increase in their knowledge of how vegetables grow. **83.8%** of participants in our Fall gardening program reported an increase in knowledge about how vegetables grow, 5.4% responded ‘No,’ while 10.8% did not answer the question.

4) In 2015, the Market recorded **\$20,473** in SNAP purchases, and **\$17,817** in Double Value Coupon sales, representing **\$22,591** (59% of total) in sales for Illinois Specialty Crop producers.

The Market saw the following sales increases over 2014:

LINK Dollars distributed: 4.2%+	Food Rx (Improving Southside
LINK redeemed: 11.84%+	Diabetes): 618.75%+
DVCP distributed: 12.43%+	The average LINK basket = \$19.57
DVCP redeemed: 16.13%+	The average DVCP basket = \$18.37
Eat Up! : 93.93%+	

Beneficiaries:

- **389** unique SNAP customers who purchased foods from the 61st Street Farmers Market in 2015
- **50** 2nd graders at the Andrew Carnegie Elementary School who participated in the 4-week Healthy Eating Workshops

- **98** Carnegie School 3rd graders who participated in 12 weeks of in-school gardening classes
- **44** Carnegie School 4th graders who participated in the after-school cooking classes at Experimental Station
- **10** youths who learned to garden in the 8-week Summer Gardening program
- **25** Jackson Park Terrace residents who participated in chef demo and Garden Day
- **17** Illinois Specialty Crop farmers who received an additional **\$22,591** (calculation based on 2014 59% Specialty Crops sales breakdown) from SNAP and Double Value Coupon sales.

Lessons Learned:

As part of our educational programming, the Market undertook a “Grow Your Own Fruit Tree” initiative, making it possible for Market customers to purchase fruit trees and learn how to tend them. An idea conceived years ago, we finally carried it out. However, ordering the fruit trees from our fruit producers and ensuring delivery turned out to be a messy undertaking. We will not likely repeat the project in the near future.

Although we targeted the Carnegie Elementary 3rd grades for our in-school gardening program, the 3rd grade teachers opted out. We were told that the primary reason was their resistance to walk the two blocks with their students to the hoop house. We adjusted to that change in the program by carrying out in-school gardening with 4th graders in the fall—the same students who had been in the 3rd grade in the spring.

We learned in 2015 that, as our food education programming grows, we will need to ensure sufficient staffing at once to carry out instruction, maintain the gardens used for instruction and maintain the hoop house. We will seek funding to add that staffing in the future.

Contact Person:

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SC-15-05

NAME OF APPLICANT

IL Grape Growers and Vintners Association

PROJECT TITLE

Provide the project's title. (Must be the title used in the approved State Plan or amendment.)

Promoting Sustainable Vineyards: Business Planning Workshops for the Illinois Grape Grower

PROJECT PURPOSE

While the number of wineries in Illinois continues to increase rapidly, the acreage devoted to the wine grape crop has not kept pace. This forces some Illinois wineries to look out-of-state for their wine grapes. More educational offerings are needed not only on how to grow grapes in this challenging climate, but also how to sell those grapes. Heretofore, grower workshops have focused on pest control and vine nutrition. The IGGVA proposes to host Business Planning Workshops for the Illinois Grape Grower. These workshops will cover the essentials to running a vineyard like a business including marketing, contracts, financial practices, and customer service.

PROJECT GOALS

In his paper entitled "Business Planning and Economics of Midwestern Grape Production," Dr. Bruce Bordelon of Purdue University states "Only serious growers who operate the vineyard as a business enterprise can expect financial success¹."

It is our aim with these workshops to help more vineyard owners learn to operate their vineyards as a business enterprise.

In our short modern history of viticulture in Illinois, we've seen most growers start on a hobby scale, then take a major financial leap to commercial-scale production without adapting practices or philosophy, and discovering just how challenging it is to establish a long-term, financially-sustainable vineyard. As the Illinois wine industry continues to grow, and gain increased visibility, it is critical that we work diligently as an industry to promote high-quality, financially-sustainable grape production throughout the state. A strong viticultural foundation promotes a strong regional identity, and with that an increased perceived value to consumers, and ultimately an ever-strengthening economic impact on rural economies. In 2012, the Illinois grape and wine industry had a statewide impact of \$692 million, a figure which will continue to grow as our industry develops³. This project is important to undertake now so that Illinois grape growers don't lose market share to out of state vineyards and bulk juice retailers. As the number of wineries increases, our in-state growers need to be poised to supply these wineries with superior-quality wine grapes.

The objectives of the Business Planning Workshops are to identify the educational needs in the business aspect of grape growing and offer speakers who can address these common issues. They may include the following aspects of the grape growing business:

- Costs of Establishment
- Long-Range Vineyard Goals
- Predicted Care and Maintenance Costs
- Economic Impact of Pest and Disease Control
- Types of Vineyard Businesses
- Insurance Considerations
- Quality-Driven Grape Growing
- Winery-Grower Contracts
- Established Grower Panel

This project is not a continuation of a project that the Specialty Crop Block Grant Program funded previously and has not been submitted to another Federal or State grant program.

Potential Impact:

In 2011, there were an estimated 175 commercial vineyards across the state of Illinois growing 1,066 acres of grapes. In addition to the 175 commercial vineyards, there were 136 hobby vineyards identified growing 41 acres of grapes. This brings total grape acreage to 1,107 acres produced by 312 growers. Compared to 2006, this suggests a 33 percent increase in the number of vineyards and hobbyists over the previous five years and a 2 percent increase in the grape acreage². In this same time period, the number of commercial wineries has increased by 36 percent. Of the 1,066 acres of commercial grapes grown in the state of Illinois, 90 percent are grown for the purpose of wine making, 4 percent for unfermented juice, 3 percent for fresh market sales, and 3 percent for other uses. Other uses include processing grapes into jams and other processed grape products as well as waste and abandonment.²

In 2012, Illinois wineries produced over 650,000 gallons of wine, at a retail value approximating \$39 million dollars³. At an optimistic average of 3 Tons/acre, and 150 gallons of wine /Ton, and 90% of Illinois-grown grapes go to wine production, the maximum possible gallons of wine produced from Illinois-grown grapes would be 431,730 gal, or about 66% of the total production . The reality is likely considerably less than that percentage, but it still indicates tremendous opportunity for development of a modern viticulture industry.

These Business Planning Workshops will help the existing commercial growers as well as the 136 hobby vineyard owners begin to meet the demand of the commercial wineries. It should also help prospective growers better consider the opportunities and obstacles related to commercial grape production. Business Planning Workshops will help encourage the growers to look at their vineyards through a business lens. As the Illinois viticulture industry becomes more business-savvy, and quality-driven, the economic impact will continue to increase.

Expected Measurable Outcomes:

The distinct and quantifiable outcome for this project will be how many growers are exposed to these business planning workshops and how their fruit quality, average price, and production levels increase as a result.

In the short term we hope to see more growers implementing business practices such as grower contracts in their dealings with wineries. This will be measured by post-workshop attendee surveys.

The benchmark will be the pre-workshop educational needs survey. It will include questions regarding business contracts and forms used in the vineyard’s dealing with commercial wineries.

Our target is to see a 50% increase in the number of business contracts being used in grape grower – winery relationships.

We will collect this data in our post-workshop survey and report on it in our monthly reports.

Work Plan:

Project Activity

The first activity will be to generate a questionnaire for the growers on what business topics would be most applicable to the success of their businesses. This will be emailed with follow-ups to unresponsive growers mailed through the U.S. Postal Service. We will use the database of grape growers generated for the 2011 USDA Grape Census.

Next, we will evaluate these responses and search for speakers based on the suggested topics. Speaker ideas are Dr. Bruce Bordelon of Purdue University, Fritz Westover of Westover Vineyard Advising, Michael White of Iowa State University, Small Business Development Center Directors, and regional specialists. The majority of vineyards are located in the Southern and South Central regions of the state. Combined, these two regions make up 66 percent of the state's vineyards². Accordingly, we will host the first Business Planning Workshop in this region. The second workshop will be held in the Northern region of the state where another concentration of growers is.

IGGVA Director of External Relations Megan Pressnall and IGGVA State Enologist Bradley Beam will work on the coordination and implementation of these workshops. Their salaries will be paid out of match dollars.

Project Activity	Who	Timeline
Generate Questionnaire for Growers	IGGVA staff with input from viticulture and enology specialists	January 1, 2015 – March 1, 2015
Evaluate Responses from Growers	IGGVA staff	March 1, 2015 – May 1, 2015
Identify speakers for workshops	IGGVA staff with input from viticulture and enology specialists	May 1, 2015 – May 31, 2015
Host 1 st Workshop in Southern IL	IGGVA Staff, speakers, and specialists	June 1, 2015 – June 30, 2015
Survey Workshop Participants	IGGVA staff	June 1, 2015 – June 30, 2015
Host 2 nd Workshop in Northern IL	IGGVA Staff, speakers, and specialists	July 1, 2015 – July 31, 2015
Survey Workshop Participants	IGGVA staff	July 1, 2015 – July 31, 2015

PROJECT ACTIVITIES

1st Quarter: Jan – Mar 2015

The first quarter of 2015 was dedicated to planning the Vineyard Business Workshop series, including the identification of locations, presenters, and topics to cover. A brief survey was also created and submitted to the Illinois grape and wine industry, with the goal of identifying the challenges faced by both existing and prospective growers. The development of content and securing of presenters is currently ongoing, but should be resolved soon. Additionally, event announcements, advertisements, and registration procedures are currently being developed, and should be dispersed soon.

2nd Quarter: Apr-Jun 2015

The second quarter of 2015 was dedicated to planning the Vineyard Business Workshop series, securing speakers and locations, creating and disseminated advertisements, creating a handbook for attendees, and executing the workshops themselves. We had about 30 people attend each workshop, including existing growers and winemakers, new growers (with grapes in the ground but not yet producing fruit), and prospective new growers. I was pleased with the quality of the speakers we brought in, including Dr. Paul Domoto of Iowa State University, Dr. Tim Martinson of Cornell University, Sarah Bowman (PhD candidate) of Southern Illinois University, and regional representatives with Farm Service Agency.



This is the basic advertisement be disseminated in “The Grapevine” magazine (print and online), “Wines and Vines” magazine (online only), Midwest Wine Press web magazine, and the IGGVA Website and Facebook pages. I also sent fliers to all the commercial wineries in Illinois to display in their tasting rooms. In all, there were 7 independent advertising efforts made, which were up for the entire month of May. We did thorough job getting the word out, but I was a little disappointed in the attendance. If I were to do it again, I would work more on non-grape related sources for advertising. I attempted to get some ads in a rural electric cooperative magazine, for instance, but had missed their deadline (though was a week early of their official deadline).

3rd Quarter: Jul-Sep 2015

No additional work has been conducted since June 2015

4th Quarter: Oct-Dec 2015

No additional work has been conducted since June 2015.

1st Quarter: Jan-Mar 2016

No additional work has been conducted since June 2015.

2nd Quarter: Apr-June 2016

Early Season Summer Viticulture Workshops, May 24, June 1, June 2

Vineyard Preparation for 2016

There are so many things to consider in order to produce a high-quality crop. This workshop will present concepts important to timely vineyard management practices, including tissue sampling canopy management, crop estimation, as well as provide tips to getting a good relationship started with a winery.

Speakers and Topics include:

Southern Illinois – May 24, Blue Sky Vineyard 1-5PM

Chris Lawlor-White, Galena Cellars: A Northern Perspective on Illinois Grape and Wine History

Allan Hyland, Galena Cellars: Overview of the NIWG Cultivar Trial

Sarah Bowman, SIU: Vineyard Data Sampling, Tissue Analysis, Crop Estimation

Brett Morrison, StarView Vineyards: Vineyard Tour and Discussion with the 2016 Viticulturist of the Year

Bradley Beam, Winery-Grower Relationships

Additionally, winemakers are encouraged to bring a wine or two to share with the group for active discussion.

Northern Illinois – June 1, Galena Cellars, 1-5PM

Chris Lawlor-White, Galena Cellars: A Northern Perspective on Illinois Grape and Wine History

Allan Hyland, Galena Cellars: Overview of the NIWG Cultivar Trial and Tour

Sarah Bowman, SIU: Vineyard Data Sampling, Tissue Analysis, Crop Estimation

Michael White, Iowa State University: Sprayer Calibration and Canopy Management

Bradley Beam; Winery-Grower Relationships

Central Illinois – June 2, Mackinaw Valley Vineyards, 1-5 PM
Sarah Bowman, SIU: Vineyard Data Sampling, Tissue Analysis, Crop Estimation
Michael White, Iowa State University: Sprayer Calibration and Canopy Management
Bradley Beam; Winery-Grower Relationships
Paul Hahn, Mackinaw Valley Vineyards: Vineyard Walk and Discussion

For more information, contact Bradley Beam at brad@illinoiswine.com, or 309.635.9463.

This series of workshops served to supplement the previous vineyard business workshops held in 2015. The goal was to focus on the financial aspect of sound viticulture practices, including canopy management, pest and disease management, maintaining strong relationships with wineries (contracts and crop estimation, and vineyard fertility. We also recruited regional growers with a strong reputation to host these workshops, to showcase these concepts in a real vineyard situation, and allowed the host to share their experience.

GOALS AND OUTCOMES ACHIEVED

*Clearly describe the progress made towards achieving the **Expected Measurable Outcomes** identified in the approved project proposal. Include any baseline data developed through the project and any results from the implementation of the project's performance measures. Provide any survey results or research data developed during the period.*

Summary of Complete Project (2015-2016)

The expected and measurable outcomes listed in the proposal include 1) How many growers are exposed to the workshops, and if their practices, quality, and price increase as a result of the workshop, and 2) Increase in the number of growers using long-term contracts for their grapes.

1. How many growers were exposed to the workshops?

In the 2015 Business Planning workshops, we had about 60 attendees, and the 2016 Early Summer viticulture workshops had 93 in attendance. The total then for both workshop series was 153 attendees. There was a total of 5 individual workshops, held in southern (2), northern (2), and central (1) Illinois.

a. Have practices, quality, and price increased?

The follow-up surveys for both workshops indicated both a strong interest in and dedication to improving their fruit through the adoption of quality-driven practices. However, the timeline of this project is much too short to adequately assess the adoption of these practices, and determine if the adoption of quality-driven practices resulted in improved quality and price.

2. It is clear that in 2015, very few growers utilized formal contracts based on quality-driven price parameters. The workshops in 2016 showed that interest in and dedication to the development of these contracts is on the rise, but still is a much smaller percentage than we had hoped. One clear reason for this is the scale of production. Not only do small acreages prohibit investment in quality-driven practices (labor costs associated with canopy management) and improved equipment (i.e. air blast sprayer), it also takes some bargaining power out of the hands of the grower. Future industry surveys and economic impact studies should further illuminate these developments.

1st Quarter: Jan-Mar 2015

A brief survey was created and sent out via an online survey platform. There were 49 responses to the survey. Here is a brief summary of the survey results:

Vineyard Business Survey Summary 3.2015

Survey Open: 3/3-3/30, 2015

Number Responses: 49

Q1: In which region is your vineyard located?

Region	# Responses
Northern IL	14
Central IL	12
South Central IL	13
Southern IL	9

Q2: How many acres of grapes do you have planted?

Range of Acres	# Responses
No vineyard	1
<1 Acre	5
1-4.9 Acres	21
5-9.9 Acres	12
10-14.9 Acres	5
15-24.9 Acres	4
25-49.9 Acres	1
>50 Acres	0

Q3: What is the age of your oldest vines?

Range of Acres	# Responses
No vineyard	1
<1 Year	1
1-4.9 Years	6
5-9.9 Years	10
10-14.9 Years	20
15-19.9 Years	8
20-29.9 Years	2
30-49.9 Years	0
>50 Years	1

Q4: Which of the following best describes your vineyard business?

Description	# Responses
No vineyard	1
Hobby-scale	5
Commercial, part-time, independent of winery	20
Commercial, full-time, independent of winery	2

Commercial, part of winery	20
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Q5: Which of the following continuing education opportunities have you attended in the last two years?

Educational Event	# Responses
Illinois Regional Workshops	41
Illinois Field Days	19
VESTA Courses	9
IGGVA Annual Conference	28
Other State/Regional Conferences	17
Other State Workshops	11

Q6: Which of the following best describes your interest level in planting new acreage in IL?

Interest	% of Responses
Extremely Interested	31
Very Interested	15
Somewhat Interested	20
Neither Interested or Disinterested	12
Somewhat Disinterested	2
Very Disinterested	14
Extremely Disinterested	6

Q7: Existing Growers: Below is a list of statements describing potential challenges to running a successful, sustainable vineyard business. Please rate the statements according to how much you agree or disagree that they represent challenges facing your vineyard business. If you do not currently have a commercial vineyard, please skip to the next question.

A: The issues most common to grape growers included keeping up with grapevine canopy management, high costs of labor and pesticides, and the lack of available skilled labor.

Q8: New plantings/vineyard expansion: Please indicate how much you agree or disagree with the following statements related to the challenges of new vineyard plantings.

A: The issues most commonly selected as significant obstacles to new plantings included climate uncertainties, costs of land too high, prices for harvested grapes is too low, it's unclear if a vineyard can be profitable, more education is needed on vineyard establishment, and equipment costs are prohibitive.

Last, some promotional materials for the events have been created:

Vineyard Development and Business Planning Seminars



June 1, 2015 Blue Sky Vineyard, Cobden IL

Directions: <http://www.blueskyvineyard.com/directions>

June 3, 2015 Joliet Jr. College, Building T Room 1000 (Conference Center)

Directions: <http://www.jjc.edu/campuses/Pages/interactive-map.aspx>

Are you ready to live the dream?

Running a vineyard requires countless hours of care, management, and planning. Most growers are willing to devote the necessary time to vine management, but strategic planning and marketing of their vineyard doesn't always get the necessary attention. Business planning strategies, vineyard marketing plans, cost accounting, and cost-saving production strategies are crucial to sustainable success over the life of the vineyard. These vineyard business seminars in northern and southern Illinois are aimed at everyone with an interest in commercial grape and wine production, including prospective growers and winemakers, small-scale hobbyists, existing growers looking to expand acreage or freshen up their business plan, and even commercial wineries without a vineyard. We hope you can join us!

Topics include:

Vineyard Cost Accounting
Money Saving Strategies for Commercial Producers
Vineyard Planting and Establishment
Grants and Government Loan Programs

Special Guests include:

Dr. Paul Domoto of Iowa State University
Dr. Tim Martinson of Cornell University
Sarah Bowman of Southern Illinois University
Regional Grape Growers and IGGVA Specialists

2nd Quarter: Apr-Jun 2015

The expected and measurable outcomes listed in the proposal include 1) How many growers are exposed to the workshops, and if their practices, quality, and price increase as a result of the workshop, and 2) Increase in the number of growers using long-term contracts for their grapes.

As mentioned previously, we did have about 60 attendees for these workshops, which was a lower number than we were hoping. However, we also created a nice handbook on vineyard establishment

and business practices, which I will make available for anyone who wants more information on starting a new vineyard, or improving their existing practices. I've attached a pdf of the handbook with this report. This handbook could do a lot for potential new growers. A follow-up survey was sent to workshop attendees, and was focused on discovering what new and useful ideas were of value:

Vineyard Business Follow-Up Survey: Response Summary

Q1: Please list at least three concepts discussed at the workshop which was either new to you, or something you found especially useful as you continue on, or begin, your vineyard business.

Vineyard layout and planning in general 2. IASU spreadsheet accounting 3. USDA crop insurance. We didn't know it was available before

It was all new!!

The importance of grower & winemaker contact The importance of a closer accurate cost account The importance of more account & fertilization records.

different trellis systems' relative merits.

The importance of site selection, vineyard expenses fixed and otherwise, vineyard investment reality.

Making soil amendments before planting. Workbook produced by Iowa.

potential costs of establishment and management worksheets will be helpful, learning that many growers are not connected with wineries, potentially get good advice from SIU in selecting sites and varieties

Q2: If we were to repeat this workshop in the future, what changes would you suggest? Was there something important we overlooked or didn't cover thoroughly?

1. Particular cultivars that would be the most successful and sought out and how to market them 2. How to find help with labor for planting, harvesting, etc. 3. More info on vineyard equipment and machinery. 4. Creative ways to startup on a limited budget 5. More info on efficient and successful spray programs and the chemicals to use

As a true beginner, describing the different trellis systems. Maybe match some of the more popular grape varieties with the proper trellis system. Pruning. Is the grape market trending towards certain grape varieties?

A panel discussion on grower methods & sales method with people from different regions in the same panel group possible a winemaker in the group All & all I thought the program was very good

More information on fixed and variable costs of establishment.

Clear and practical solutions to problems faced in the vineyard.

More hands on Vineyard time. It might not be related to topic however people who come to these workshops usually have lots of questions.

some presenters could show entire slides and just talk to key points instead of reading the slides

Q3: Moving forward, is there anything you will change about either your production or business practices? If so, please explain.

1. Choosing a cultivar for future expansion that is more suited for our land/area. 2. Using more detailed accounting practices 3. Have our soil tested

Just getting started.

Possibly use of more fertilizer & ask more for my GOOD product & and closer record keeping Also a closer look at when to get help

More research on Illinois particular legal impediments to selling production. Evidently there are anomalous restrictions on wine producers' ability to sell direct to stores, restaurants, etc.

a distinct and clear understanding of monetary input and output of vineyard operation in the Midwest.

Examine trellis systems for new plants. These guys seemed to really like single high wire.

We may forego establishing a large vineyard in favor of a small vineyard and contracting with existing growers to get grapes and help them with their business

The concept of quality-driven grape contracts was new to most growers in attendance. Out of the 60 attendees, 90% didn't use a formal contract of any kind. Of course, this includes those whose vineyards are not yet established or productive. It will take some time to fully understand the impact of these workshops as it relates to contracts, but I intend to conduct an annual growers survey to establish acreage, varieties, expected tonnage, and use of contracts in 2015, 2016, and 2017, so we should get an idea of whether or not an increase in formal contracts is happening in the industry.

2016 Early Season Viticulture Workshops – May 24, June 1, June 2

The expected and measurable outcomes listed in the proposal include 1) How many growers are exposed to the workshops, and if their practices, quality, and price increase as a result of the workshop, and 2) Increase in the number of growers using long-term contracts for their grapes.

May 24, Southern Illinois Workshop, Blue Sky Vineyard

We had 34 people in attendance for this workshop, consisting primarily of experience growers, but also had 3 growers in attendance who were just getting underway.

June 1, Northern Illinois Workshop, Galena Cellars

We had 30 people in attendance for this workshop, including 4 growers with new vineyards. The northern Illinois attendees varied from seasoned veterans of the Illinois industry to small-scale commercial producers to hobby-scale growers.

June 2, Central Illinois Workshop, Mackinaw Valley Vineyard

We had 29 people in attendance for this workshops, which included 9 growers who had recently established vineyards.

We conducted a follow-up survey to establish whether the workshop efforts successfully influenced grower intent and future behavior. Out of 93 in attendance, we only received 11 responses, which translates into a 12% return.

Here are the results:

How large is your vineyard, in acres? Please select 1.

- Answered: 11
- Skipped: 0

Answer Choices	Responses
– < 1 Acre and/or still in the planning stages	18.18% 2
– 1.0 -2.0 Acres	36.36% 4
– 2.1 - 5.0 Acres	27.27% 3

Answer Choices	Responses
– 5.1 - 10.0 Acres	18.18% 2
– 10.1 - 20.0 Acres	0.00% 0
– > 20 Acres	0.00% 0
Total	11

How old are your oldest vines? Please select 1.

- Answered: 11
- Skipped: 0

Answer Choices	Responses
– < 1 year (planted this season)	0.00% 0
– 1.0 - 3.0 years	9.09% 1
– 3.1 - 5.0 years	18.18% 2
– 5.1 - 10.0 years	54.55% 6
– 10.1 - 20.0 years	18.18% 2
– > 20 years	0.00% 0
Total	11

Topics covered at 2016 summer viticulture workshops: Please select the option for each statement based on how much you agree or disagree. If the topic wasn't covered at your specific workshop, select "N/A".

- Answered: 11
- Skipped: 0

	Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree	N/A	Total	Weighted Average
Since this workshop, I am more likely to conduct a soil and/or petiole test to evaluate vineyard fertility.	18.18% 2	63.64% 7	9.09% 1	0.00% 0	0.00% 0	9.09% 1	11	4.10
In the next three years, I plan to develop and use formal contracts to buy or sell fruit based on chemical and sensory parameters.	9.09% 1	18.18% 2	36.36% 4	18.18% 2	0.00% 0	18.18% 2	11	3.22
This workshop stressed the importance of canopy management to the production of quality wine.	54.55% 6	45.45% 5	0.00% 0	0.00% 0	0.00% 0	0.00% 0	11	4.55
This workshop gave me the tools to more accurately estimate crop loads.	18.18% 2	54.55% 6	18.18% 2	0.00% 0	0.00% 0	9.09% 1	11	4.00
Sprayer type has an impact on my ability to prevent pest and disease issues in the vineyard.	36.36% 4	45.45% 5	18.18% 2	0.00% 0	0.00% 0	0.00% 0	11	4.18

	Strongly Agree	Agree	Neither Agree/Disagree	Disagree	Strongly Disagree	N/A	Total	Weighted Average
In the next five years, I plan to purchase an air blast sprayer (check N/A if already using one)	0.00% 0	9.09% 1	18.18% 2	9.09% 1	9.09% 1	54.55% 6	11	2.60

Future Directions: Please help shape the future of viticulture education in Illinois by listing any topics you would like to see presented at future workshops or conferences.

- Answered: 5
- Skipped: 6

Showing 5 responses

I believe the topics being selected are on track. Thanks

7/7/2016 11:36 AM [View respondent's answers](#)

The workshop was excellent. Love the hands on pruning part. Would like to see frank, honest discussion with vineyard owners and wineries on quality concerns and fair pricing for the crop. After 6 years of selling grapes we barely break even which doesn't take in consideration our time. I can see more vineyards getting out of the business. Would like to see more vineyard owners attend these sessions. Having wineries pay a premium to those growers who follow pre determined quality standards, attend workshops, etc may help get people to attend. I feel it is critical that growers need to up their knowledge basis. Keep up the good work.

7/6/2016 8:03 PM [View respondent's answers](#)

Pest management is always a good one

7/6/2016 6:34 PM [View respondent's answers](#)

Still just a new grower and like all information available, please keep up any and all classes! Thanks

7/6/2016 5:49 PM [View respondent's answers](#)

We more info. put out to new vineyards to be planted, starting with site selection, preparation from proper planting hole, trellis, post , etc. and proper management up to the 5th yr.

7/6/2016 5:24 PM [View respondent's answers](#)

2016 Survey Results Summary:

Out of the 11 respondents, over 50% were currently growing less than 2 acres, and just over 25% have been operational less than 5 years.

Generally, it appears that while we are generating awareness of the importance of basic viticulture concepts like canopy management, fertility, and pest management, the likelihood of financial investment as a means to successfully implement these concepts was not great. For example, 9 out of 11 respondents indicated that they understand that sprayer type directly impacts their ability to successfully manage vineyard pests and diseases, but only 1 indicated a plan to purchase an air blast sprayer in the next 5 years. The scores for the importance of canopy management, fertility, and disease management were all high, indicating that the workshops effectively stressed the importance of these topics. I believe the explanation for this disconnect between thought and action lies in the vineyard data. For new growers, with

low acreage, it is challenging to afford to invest money in equipment as it will take considerable time to pay it off, and the financial risk is lower anyway.

When evaluating the use, or intended use, of formal contracts based on chemical and sensory quality parameters, the results were more optimistic. In the next 3 years over 25% of respondents indicated a plan to incorporate formal contracts into their vineyard or winery business. An additional 18% selected "N/A" for this question, indicating that they are already using formal contracts as part of their vineyard and winery business.

If the project has the potential to benefit non-specialty crop commodities, describe the activities that were conducted to ensure that grant funds were used to solely enhance the competitiveness of specialty crops.

This is not being marketed to any crop other than grapes.

If a target of a project has already been achieved, project staff is encouraged to amend the outcome measure in the performance report. This permits the project staff to "stretch" the goals in order to go beyond what they are already doing.

PROJECT BENEFICIARIES

The direct project beneficiaries include existing grape growers and wine makers in Illinois, prospective grape growers and wine makers in Illinois. Currently, there are approximately 110 wineries in Illinois, and 175 vineyards.

The indirect project beneficiaries include tourism in Illinois, rural communities, and individuals who may become employees of these business as they grow and develop.

The official data on prospective growers and winemakers does not exist, but there is definitely interest out there for both new vineyards and wineries in the next 5 years.

We had a total of 153 grape growers, wine makers, and prospective growers and winemakers at the 5 workshops.

They above benefitted from this project by being exposed to two concepts:

1) The economics of starting a vineyard in Illinois

At the 2015 vineyard business workshops, attendees learned about the costs associated with starting a vineyard, and the importance of conducting a business plan in advance of planting. This shows, in real numbers, just how challenging it is to make a vineyard profitable at a small scale. This information will encourage those interested in planting a vineyard to take the business side seriously, and to see the vineyard as a long-term project.

2) During the 2016 summer viticulture workshops, attendees learned the importance of making quality a factor in pricing, and then also discovered that time spent on fertility, canopy management, disease management, and winery relationships will benefit them financially. They also learned that if they apply quality-driven practices, and factor fruit quality into a formal grower contract, they can make more money growing grapes than they previously thought.

PROJECT LESSONS LEARNED

The main lesson learned from this project was that growers need to see financial benefit in order to adopt new practices. If they believe, and you can prove, that a specific practice will result in more income, and therefore make their business more profitable, they are more likely to listen, and have more incentive to change their ways.

This concept is perhaps easier to communicate to new growers than those that are already locked into their particular habits. For example, we often hear experienced growers complain about not making enough money, but seldom do we hear them critique their own practices, perform cost-benefit analysis of a particular aspect of their operation, etc.

Moving forward, it would be wise for us to include the cost incentive rationale behind best production practices.

As for the project implementation itself, getting survey results was challenging, especially in 2016. We conducted this survey via the internet, and it would have yielded better results if conducted at the workshops, in person, before allowing attendees to exit.

[Click here to enter text.](#)

FUTURE PROJECT PLANS

*Briefly describe the work to be accomplished in the next reporting period. What specific tasks from the **Work Plan** of the approved project proposal will be accomplished? Make sure to include those activities that will be required to track and collect the data necessary to report on the **Expected Measurable Outcomes** from the approved project proposal.*

We intend to continue to evaluate the use of formal contracts, and also track industry growth over the 5 years via industry survey and/or economic impact studies. This work is not part of this specific project, but will shed more light on the effectiveness of the vineyard business workshops in 2015.

FUNDING EXPENDED TO DATE

Provide the actual dollar amount or percentage of grant funds expended on the project from the beginning of the project to the end of the reporting period covered by this report, regardless of whether subgrantee expenses have been reimbursed by the State.

All of the grant funds, totaling \$15,500.00 have been expended. The budget sheet and documentation are attached to this final report.

REPORT SUBMISSION INFORMATION

Report Submitted By: Bradley Beam

Illinois Grape Growers and Vintners Association

2900 Greenbriar Dr.

Springfield, IL 62704

Phone:309.635.9463

Email:brad@illinoiswine.com

Date Submitted: 7/13/2016

2015 Illinois Specialty Crop Grant Program

Budget Information

Expenditure	Notes	Category	Invoice Number	Amount on Invoice Charged Against Grant	Amount of Matching Funds	Amount of In-Kind Contributions	Total
Bricker Publishing	advertising grapevine mag print	Contractual		\$ 665.00	\$ -	\$ -	\$ 665.00
Wines and Vines	advertising wines and vines mag online	Contractual		\$ 825.00	\$ -	\$ -	\$ 825.00
Bricker Publishing	advertising grapevine mag online	Contractual		\$ 550.00	\$ -	\$ -	\$ 550.00
Hotels.com	hotel expenses best western joliet	Travel		\$ 384.16	\$ -	\$ -	\$ 384.16
Hotels.com	hotel expenses holiday inn carbondale	Travel		\$ 847.14	\$ -	\$ -	\$ 847.14
Bradley Beam	car rental	Travel		\$ 339.22	\$ -	\$ -	\$ 339.22
Bradley Beam	misc supplies - printing	Supplies		\$ 195.30	\$ -	\$ -	\$ 195.30
Bradley Beam	misc supplies	Supplies		\$ 208.04	\$ -	\$ -	\$ 208.04
Timothy Martinson	Speaker Fee	Contractual		\$ 2,000.00	\$ -	\$ -	\$ 2,000.00
Timothy Martinson	Travel expenses	Travel		\$ 532.30	\$ -	\$ -	\$ 532.30
Paul Domoto	Travel expenses	Travel		\$ 537.93	\$ -	\$ -	\$ 537.93
Paul Domoto	Speaker Fee	Contractual		\$ 2,000.00	\$ -	\$ -	\$ 2,000.00
Blue Sky Vineyard	Venue Rental	Contractual		\$ 450.00	\$ -	\$ -	\$ 450.00
Joliet Jr College	Venue Rental	Contractual		\$ 319.83	\$ -	\$ -	\$ 319.83
Sarah Bowman	Travel expenses	Travel		\$ 377.78	\$ -	\$ -	\$ 377.78
Sarah Bowman	Speaker Fee	Contractual		\$ 1,500.00	\$ -	\$ -	\$ 1,500.00
Single Stereo Ltd	creation of web and print ads	Contractual		\$ 200.00	\$ -	\$ -	\$ 200.00

2016 Early Summer Viticulture Workshops

Bradley Beam	Speaker Fee	Contractual		\$ 818.30	\$ -	\$ -	\$ 818.30
Sarah Bowman	Speaker Fee	Contractual		\$ 1,200.00	\$ -	\$ -	\$ 1,200.00
Allan Hyland	Speaker Fee	Contractual		\$ 450.00	\$ -	\$ -	\$ 450.00
Michael White	Speaker Fee	Contractual		\$ 800.00	\$ -	\$ -	\$ 800.00
Chris Lawlor	Speaker Fee	Contractual		\$ 300.00	\$ -	\$ -	\$ 300.00
					\$ -	\$ -	\$ -
TOTAL				\$ 15,500.00	\$ -	\$ -	\$ 15,500.00
				Column Total should equal grant amount.	\$ -	\$ -	

IGGVA
Job Actual Cost Detail
January 1993 through August 2016

Type	Date	Num	Source Name	Memo	Account	Class	Amount
Department of Agriculture							
15 Specialty Crop							
Bill	04/17/2015	GV39...	Bricker Publishing		Advertising & Promotion	Worksho...	665.00
Bill	05/11/2015	2335	Wines & Vines		Advertising & Promotion	Worksho...	825.00
Bill	05/11/2015	GV39...	Bricker Publishing		Advertising & Promotion	Worksho...	550.00
Credi...	05/16/2015		Hotels.com		Travel	Worksho...	384.16
Credi...	05/20/2015		Hotels.com		Travel	Worksho...	847.14
Bill	06/11/2015	Work...	Bradley Beam	Brad's travel	Travel	Worksho...	339.22
Bill	06/11/2015	Work...	Bradley Beam	Workshop Reimburse...	Event Supplies	Worksho...	195.30
Bill	06/11/2015	Work...	Bradley Beam	Workshop Reimburse...	Venue Rental & Catering	Worksho...	208.04
Bill	06/11/2015	works...	Timothy Martinson		Speaker/Trainer Fees	Worksho...	2,000.00
Bill	06/11/2015	works...	Timothy Martinson	speaker travel	Travel	Worksho...	532.30
Bill	06/11/2015	Spea...	Paul Domoto	speaker travel exp.	Travel	Worksho...	537.93
Bill	06/11/2015	2015-...	Paul Domoto	venue rental	Speaker/Trainer Fees	Worksho...	2,000.00
Bill	06/11/2015	16576	Blue Sky Vineyards V	venue rental	Venue Rental & Catering	Worksho...	450.00
Bill	06/11/2015	wrksh...	Joliet Junior Colleg...	food for wrkshp	Venue Rental & Catering	Worksho...	319.83
Bill	06/11/2015	speak...	Sarah Bowman V	speaker travel	Travel	Worksho...	377.78
Bill	06/20/2015	print ...	Sarah Bowman V	creation of print & web ...	Speaker/Trainer Fees	Worksho...	1,500.00
Bill	07/06/2015	Vit W...	Single Stereo LTD	May 24th-StarView, Ju...	Website & IT	Worksho...	200.00
Bill	06/23/2016	Vit W...	Sarah Bowman V	May 24th-StarView, Ju...	Speaker/Trainer Fees	Worksho...	1,200.00
Bill	06/23/2016	Vit W...	Chris Lawlor	May 24th-StarView, Ju...	Speaker/Trainer Fees	Worksho...	300.00
Bill	06/23/2016	Vit W...	Michael White	May 24th-StarView, Ju...	Speaker/Trainer Fees	Worksho...	800.00
Bill	06/23/2016	Vit W...	Allan Hyland	May 24th-StarView, Ju...	Speaker/Trainer Fees	Worksho...	450.00
Bill	06/23/2016	Vit W...	Bradley Beam	May 24th-StarView, Ju...	Speaker/Trainer Fees	Worksho...	818.30
Total 15 Specialty Crop							15,500.00
Total Department of Agriculture							15,500.00
TOTAL							15,500.00

Bricker Group, LLC

THE
GRAPEVINE
MAGAZINE

P.O. Box 1590

Fort Dodge, IA 50501

Invoice

Date	Invoice #
4/10/2015	GV3934

Bill To
ILLINOIS WINE & GRAPE GROWER ASSOC BRAD BEAM 2900 GREENBRIAR DR SPRINGFIELD, IL 62704

Ship To
ILLINOIS WINE & GRAPE GROWER ASSOC BRAD BEAM 2900 GREENBRIAR DR SPRINGFIELD, IL 62704

Phone #	Fax #	E-mail	Web Site
877-892-5332	515-573-8790	cb@thegrapevinemagazine.net	http://www.thegrapevinemagazine.net

P.O. No.	Terms	Due Date	Rep	Ship Date	Project
	Net 30	5/10/2015	CB	4/10/2015	

Item	Description	Qty	Rate	Class	Amount
1/4 PAGE ...	1/4 PAGE AD	1	665.00	GV-MAY/JUNE 2015	665.00
<p><i>Please Note: Effective January 1, 2013, all past due amounts are subject to a 10% Finance Charge. Thank you for your prompt payment!</i></p>					<p>Total</p>
					\$665.00

Call 2310
H-17-5

WINE & VINES

Illinois Grape Growers & Vintners Assoc. c
2900 Greenbriar Rd., Suite 4
Springfield, IL 62704

PLEASE NOTE OUR NEW ADDRESS:
65 Mitchell Blvd, Ste A
San Rafael, California 94903
415.453.9700 | Fax: 415.453.2517
winesandvines.com
Federal Tax ID# 80-0014108

PAY TO THE ORDER OF

ADVERTISING INVOICE NUMBER:	22854
70-933-711	Invoice Date: 4/22/2015
	Due Date: 5/22/2015
	Purchase Order: _____
	\$ _____

INVOICE Terms: Net 30 Days

DOLLARS

Security features. Details on back.

MEMO

Illinois Grape Growers & Vintners Association
Bradley Beam
2900 Greenbriar Rd, Suite 4
Springfield IL 62704
U.S.A.

ADVERTISER NAME:

Illinois Grape Growers & Vintners Association
Bradley Beam
2900 Greenbriar Rd, Suite 4
Springfield, IL 62704
U.S.A.
309-635-9463
Mid-West

AUTHORIZED SIGNATURE



Illinois Grape Growers & Vintners Assoc.

Phone: 309-635-9463
FAX:

2335

ADVERTISING: AD SIZE AD TYPE RATE ISSUE AMOUNT

Banner ad	4 Color	1x	May	\$825.00
winesandvines.com				

ADVERTISING SUBTOTAL: \$825.00

Special Positioning Surcharge: _____

Rebate: _____

Total Paid: _____

Production fee for ad changes: _____

Production fee tax (CA only: 7.25%): _____

Total due by: 5/22/2015 \$825.00

Illinois Grape Growers & Vintners Assoc.

2335

FOR CREDIT CARD PAYMENTS, PLEASE COMPLETE THIS INFORMATION VISA MASTERCARD AMEX

Credit Card # _____ Expiration Date: ____/____ (MM/YY)

BILLING ADDRESS: _____ CVC CODE: _____

NOTES

Please make sure the invoice number appears on your check to ensure proper processing of payment.

All accounts are due and payable within 30 days from invoice Date.
Finance charge of 2% per month (Annual Percentage Rate of 24%) charged on all past due accounts.

SC 15
Vine Business WORKSHOP
Call 2341
5-11-15

Bricker Group, LLC

THE
GRAPEVINE
MAGAZINE

P.O. Box 1590

Fort Dodge, IA 50501

Invoice

Date	Invoice #
4/24/2015	GV3954

Bill To
ILLINOIS WINE & GRAPE GROWER ASSOC BRAD BEAM 2900 GREENBRIAR DR SPRINGFIELD, IL 62704

Ship To
ILLINOIS WINE & GRAPE GROWER ASSOC BRAD BEAM 2900 GREENBRIAR DR SPRINGFIELD, IL 62704

Phone #	Fax #	E-mail	Web Site
877-892-5332	515-573-8790	cb@thegrapevinemagazine.net	http://www.thegrapevinemagazine.net

P.O. No.	Terms	Due Date	Rep	Ship Date	Project
	Net 30	5/24/2015	CB	4/24/2015	

Item	Description	Qty	Rate	Class	Amount
EBLAST WEB	EBLAST WEB AD-DOUBLE PAGE TILE-APRIL AND MAY 2015	1	350.00 200.00	EBLAST	350.00 200.00
<p>Please Note: Effective January 1, 2013, all past due amounts are subject to a 10% Finance Charge. Thank you for your prompt payment!</p>					
Total					\$550.00

Handwritten: CB 2338
5-11-15



**Best
Western.**

**Best Western Joliet Inn & Suites
4380 Enterprise Dr
Joliet, IL 60431
PH (815) 730-7500
Fax (815) 730-7400**

FOLIO: 203950

1	06/02/2011 RM	#311 BEAM, BRADLEY	GUEST	\$84.99 auto
2	06/02/2011 LT	LOCAL TAX	GUEST	\$5.95 auto
3	06/02/2011 ST	STATE TAX	GUEST	\$5.10 auto
4	06/03/2011 MC	#311 BEAM, BRADLEY	GUEST	(\$86.04) JB

Total: \$0.00

FOLIO: 203951

1	06/02/2011 RM	#223 MARTINSON, TIM	GUEST	\$84.99 auto
2	06/02/2011 LT	LOCAL TAX	GUEST	\$5.95 auto
3	06/02/2011 ST	STATE TAX	GUEST	\$5.10 auto
4	06/03/2011 AX	#223 MARTINSON, TIM	GUEST	(\$96.04) JB

Total: \$0.00

FOLIO:203952

1	06/02/2011 RM	#317 DOMOTO, PAUL	GUEST	\$84.99 auto
2	06/02/2011 LT	LOCAL TAX	GUEST	\$5.95 auto
3	06/02/2011 ST	STATE TAX	GUEST	\$5.10 auto
4	06/03/2011 MC	#317 DOMOTO, PAUL	GUEST	(\$96.04) JB

Total: \$0.00

FOLIO:203953

1	06/02/2011 RM	#315 BOWMAN, SARAH	GUEST	\$84.99 au
2	06/02/2011 LT	LOCAL TAX	GUEST	\$5.95 au
3	06/02/2011 ST	STATE TAX	GUEST	\$5.10 au
4	06/03/2011 VI	#315 BOWMAN, SARAH	GUEST	(\$96.04) JB

Total: 50.00

Hotels.com

Hotels.com Confirmation Number : **122567120151-2**

Booked: Online - Tuesday, May 19, 2015 5:17:02 PM CDT

Your Receipt

Billing Name: Teresa A. Mavis
 Billing Address: 62704
 US

Booking Details

Guest Name 1 :	Bradley Beam	Room Type:	One King Bed Leisure Non smoking
Guest Name 2 :	Tim Martinson	Room Type:	One King Bed Leisure Non smoking
Guest Name 3 :	Paul Bomoto	Room Type:	One King Bed Leisure Non smoking
Check-in:	Sunday, May 31, 2015	Hotel Details:	Holiday Inn Carbondale- Conference Center
Check-out:	Tuesday, June 2, 2015		2300 Reed Station Parkway
Number of Nights:	2		Carbondale
Number of Rooms:	3		US
			+16185492600

Charges:	USD \$
Room 1	
Sunday, May 31, 2015:	\$123.85
Monday, June 1, 2015:	\$123.85
Room 2	
Sunday, May 31, 2015:	\$123.85
Monday, June 1, 2015:	\$123.85
Room 3	
Sunday, May 31, 2015:	\$123.85
Monday, June 1, 2015:	\$123.85
Discount applied:	\$0.00
Sub-total:	\$743.10
Tax recovery charges and service fees:	\$104.04
Total Price:	\$847.14
Amount paid:	\$847.14
Amount still due:	\$0.00

Payment Method:

Visa

Credit Card Number:

486670XXXXXX3580

Cancellation Policy

- *If you change or cancel your booking after 6:00 PM, 05/29/15 ((GMT-06:00) Central Time (US & Canada)) you will be charged for 1 night (including tax)*
- *If you change or cancel your booking on or before 6:00 PM, 05/29/15 ((GMT-06:00) Central Time (US & Canada)) you will be charged for 1 night (including tax)*

We will not be able to refund any payment for no-shows or early check-out.

You were charged for the full payment of this booking.

Any additional charges and fees incurred during your stay will be charged to your hotel's local currency and may be subject to a foreign exchange fee.

This receipt was printed on: Friday, July 8, 2016 10:17:15 AM CDT

This is not a VAT invoice.

Retain this copy for statement verification.

Please note that if you make changes in your booking, they could result in charges applicable by policy and availability.

Your booking confirmation does act as payment proof. Therefore, the "tax" charges referred to on your reservation confirmation do not relate to sales taxes charged to you by Hotels.com, but to any transaction taxes incurred by Hotels.com (e.g. sales and use, hotel occupancy tax, excise tax, etc.) that Hotels.com pay directly to the hotel in relation to your reservation.

Please see the website for Terms and Conditions:

https://www.hotels.com/customer_care/terms_conditions.html



Rental Location
PEORIA AIRPORT
6100 W EV MCKINLY DIRKSEN PKWY
PEORIA IL 61607

RA # 734518024
31-MAY-2015 08:59 AM
Phone (309)6970566
03-JUN-2015 08:33 PM

Bill Ref# 70031858814
Renter Name BRADLEY BEAM
2107 HAZLEWOOD DR
URBANA IL 61801

Contract ID

Vehicle # FR632416
Model GCARAVAN
Class Driven MVAR
Class Charge MVAR
License# GAQ8575
State/Province OHIO
M/Kms Driven 941
M/Kms Out 18992
M/Kms In 19933

Rate Info

Charges	No	Unit	Price/Unit	Amount
TIME & DISTANCE	4	Days	65.37	261.48 *
UNLIMITED MILES/KM - TIME & DIST		M/Kms		0.00 *
DOLLARS OFF - COUPON	1	Rental	-25.00	-25.00 *
CFC FEE \$3.50/DAY	4	Days	3.50	14.00
AIRPORT RECOUPMENT 10 PCT			236.48	23.65 *
VLCRF \$1.30/DAY	4	Days	1.30	5.20 *
AUTO RENTAL TAX @6.000 %			265.33	15.92

Handwritten: 2378
6-11-15
Signature:

Messages

* Taxable Items
Subject to Audit

Total Charges

USD 295.25

Payments

Master Card 7954

AUTH: 090025 31-MAY-2015 295.25

Payment

-295.25

Amount Due

USD 0.00

Customer Service Number 1-800-445-5664

8325 North Allen Road Peoria, IL 61615 Ph: 309-691.6500 Fax:309-691-6624
 100 North University Normal, IL 61761 Ph: 309-452-6123 Fax: 309-452-6213

Invoice 258294



DATE 5/29/15

BRAD BEAM
309.635.9463

P.O.

QUANTITY	DESCRIPTION	AMOUNT
60	BLACK AND WHITE COPIES, Paper: 20 Lb Report Laser White, Final Size: 8.5X11	188.92
PIP PRINTING LASERLIN 8325 N ALLEN RD PEORIA, IL 61615 TERMINAL ID. : 03874117 MERCHANT #: 260175910884 MC *****7954 SALE BATCH: 001180 INVOICE 1732159562 DATE: May 29, 15 TIME: 16:25 SEQ: 0029 AUTH: 162538		
Sales Rep: House Taken By: Beth CASH CHECK _____ MC VISA DIS AMEX REF# <u>162538</u>		Subtotal 188.92 Tax 6.38 Postage/Shipping 0.00 Total 195.30
TOTAL \$195.30 BRADLEY A BEAM CUSTOMER COPY		

Ordered by: _____ Date: _____

Received by: _____ Date: _____ Number of Cartons: _____

THIS IS YOUR INVOICE. NO OTHER WILL BE SENT. PLEASE INDICATE ON YOUR CHECK WHICH INVOICE NUMBERS YOU ARE PAYING. IN ACCORDANCE WITH OUR STANDARD TERMS (10 DAYS FROM RECEIPT OF GOODS), A CHARGE OF 1% PER MONTH WILL BE MADE ON PAST DUE BALANCES.

Subject to Terms & Conditions listed on reverse.

WHERE BUSINESS GOES TO GROW.™



www.youtube.com/go2pip



www.facebook.com/pippeoria



www.flickr.com/go2pip

Contact us for a solution customized to your business objectives. 309.691.6500 | www.go2pip.com

17th Street Bar & Grill
32 North 17th Street
Murphysboro, IL 62966

Server: Alexis
02:47 PM
Table 126/1

DOB: 05/31/2015
05/31/2015
3/30024

PONTIAC SHELL
1918 W REYNOLDS
PONTIAC IL 61764

SALE

Mastercard 3145745
Card #XXXXXXXXXX7954
Magnetic card present: BEAM BRADLEY A
Card Entry Method: S
Approval: 144716

Amount: \$ 35.18
+ Tip: _____
= Total: 43.00

I agree to pay the above
total amount according to the
card issuer agreement.

X

COME SEE US ON SUNDAYS!!
OPEN FROM 10 A.M. - 6 P.M.
Suggested Tips:
15%: 4.88
18%: 5.85
20%: 6.50

** RESTAURANT COPY **

SHELL
57422840207
I 95 & RT 116
PONTIAC, IL
61764
06/03/2015 476293264
06:42:28 PM

XXXX XXXX XXXX 7954
MASTERCARD
INVOICE 360735
AUTH 183906

PUMP# 1
REGULAR 17.183G
PRICE/GAL 2.559
FUEL TOTAL \$ 43.97
CREDIT \$ 43.97

Buy new Shell V-Power NiTRO+ Premium
Gasoline and gain 10 entries to win a
BMW!

Shell V-Power NiTRO+...the BEST total
engine protection you can get.

THANKS FOR SHOPPING AT SHELL
DON'T FORGET TO COME IN
FOR YOUR WINNING LOTTO TICKET

WELCOME TO
 MARKETPLACE SHELL
 MARKETPLACE SHELL 57 444 358709
 2301 PARKWAY BLVD S1D0982
 CARBONDALE IL 62901

FAT BOTTOM BETTY'S
 2310 Reed Station Pkwy
 Carbondale, IL 62901
 (618)457-3625
 Table Sales

Descr.	qty	amount
UNLD CA #02	17.725G	47.84
SELF @ 2.699/ G		
T COFFEE REFILL	1	0.92
	Sub Total	48.76
	Tax	0.08
	TOTAL	48.84
	CASH \$	50.00
	Change \$	-1.16

THANK YOU
 PLEASE COME AGAIN

REG# 0002 CSH# 011 DR# 01 TRAN# 24338
 06/02/15 06:07:37 ST# HBA1

Date: 5/31/2015 Time: 8:18:25 PM
 Status: Approved
 Card Type: Visa Card
 Card Num: 4111 1111 1111 1111
 Swipe/Type:
 Server ID:
 Server Name:
 Check Number:
 Tab Number:
 Persons:
 Card Owner:
 AMOUNT 01.21

Gratuity 12.79
 TOTAL 74.00

Approval: 201838

KEEP THIS COPY FOR
 YOUR RECORDS



Gourmet within reach.

2609 W. Jefferson Street
 Joliet IL 60435
 (815) 280-0244

Host: Alexis
 ORDER #720

06/02/2015
 9:39 PM
 10630

Chicken Burrito	6.50
Carnitas Burrito (2 @6.95)	13.90
Guacamole (2 @1.95)	3.90
Carnitas Burrito	6.95
Small Soda (4 @1.80)	7.20
Subtotal	38.45
Tax	3.75
DINE IN Total	42.20
Mastercard #XXXXXXXXXXXX7954	42.20
Authorizing...	
Balance Due	42.20

Order online at chipotle.com

June 9, 2015

Bradley Beam

IGGVA
2900 Greenbriar Dr, Suite 3
Springfield, IL 62704

Dear Brad:

Thanks to you and the IGGVA for inviting me to be a part of the **IGGVA Vineyard Development and Business Planning Seminars** on June 1 and June 3, as well as the vineyard visits on 31 May and June 2.

I enjoyed getting to know more about the IL grape and wine industry, and was impressed by what I saw and tasted. It was a pleasure participating in the tours and workshop with Paul Domoto, Sarah Bowman, and you.

I've attached an invoice, with the Speaker Fee, and airfare – which was my only real travel expense, as all the meals were provided.

Thanks again, it was great spending the time with you in IL.

With regards,

A handwritten signature in cursive script, appearing to read "Tim E. Martinson".

Tim Martinson

Sr. Extension Associate

Cornell University

June 9, 2015

Tim Martinson
3149 Van Dorn Corners Rd
Ithaca, NY 14850
tem2@cornell.edu
607.592.2616

To: IGGVA
2900 Greenbriar Dr, Suite 3
Springfield, IL 62704

Tel. 309.635.9463

INVOICE: IGGVA Vineyard Development and Business Planning Seminars
May 31-June 2, 2015

Contractual Speaker Fee:	\$ 2000.00
<u>Travel Reimbursement:</u>	<u>\$ 532.30 (airfare Ithaca – St Louis)</u>
Total:	\$ 2532.30

Payable to : Timothy Martinson
3149 Van Dorn Corners Rd.
Ithaca, NY 14850

2385
6-11-15
SCB

From: Delta Air Lines
To: Tim E. Martinson
Subject: TIMOTHY E ITHACA NY 31MAY15
Date: Friday, May 01, 2015 1:52:39 PM

Thanks for choosing Delta. Your flight is confirmed.



Hello, **TIMOTHY EE**

SkyMiles[®] #*****335 >

Your Trip Confirmation #: **G2IFQ3**



Sun, 31MAY	DEPART	ARRIVE
DELTA 3837*	ITHACA NY	DETROIT
MAIN CABIN (L)	6:20am	7:48am
DELTA 1568	DETROIT	ST LOUIS
MAIN CABIN (L)	8:55am	9:33am
Sun, 07JUN	DEPART	ARRIVE
DELTA 3624*	MILWAUKEE	DETROIT
MAIN CABIN (K)	10:50am	1:01pm
DELTA 3761*	DETROIT	ITHACA NY
MAIN CABIN (K)	1:45pm	3:03pm

*Flight 3837 Operated by ENDEAVOR AIR DBA DELTA CONNECTION

*Flight 3624 Operated by ENDEAVOR AIR DBA DELTA CONNECTION

*Flight 3761 Operated by ENDEAVOR AIR DBA DELTA CONNECTION

Passenger Info

NAME	FLIGHT	SEAT
TIMOTHY EE MARTINSON	DELTA 3837	02C
SkyMiles #*****335	DELTA 1568	07D
Silver	DELTA 3624	15C
	DELTA 3761	01C

Visit delta.com or use the Fly Delta app to view, select or change your seat.
If you purchased a Delta Comfort+™ seat or a Trip Extra, please visit My Trips to access a receipt of your purchase.

Flight Receipt

Ticket #: 0062308503786-87

Place of Issue: Delta.com

Issue Date: 01MAY15
Expiration Date: 01MAY16

METHOD OF PAYMENT

AX*****1009 **\$523.20 USD**

CHARGES

Air Transportation Charges

Base Fare **\$444.64 USD**

Taxes, Fees and Charges

United States - September 11th Security **\$11.20 USD**

Fee(Passenger Civil Aviation Security Service Fee)
(AY)

United States - Passenger Facility Charge (XF) **\$18.00 USD**

United States - Flight Segment Tax (ZP) **\$16.00 USD**

United States - Transportation Tax (US) **\$33.36 USD**

TICKET AMOUNT **\$523.20 USD**

This ticket is non-refundable unless the original ticket was issued at a fully refundable fare. Some fares may not allow changes. If allowed, any change to your itinerary may require payment of a change fee and increased fare. Failure to appear for any flight without notice to Delta will result in cancellation of your remaining reservation.

Note: When using certain vouchers to purchase tickets, remaining credits may not be refunded. Additional charges and/or credits may apply.

Fare Details: ITH DL X/DTT Q9.30 DL STL202.79LE21A0NQ /-MKE DL X/DTT Q9.30 DL ITH223.25KE21A0NQ
USD444.64END ZP ITHDTWMKEDTW XF ITH4.5DTW4.5MKE4.5DTW4.5

Checked Bag Allowance

The fees below are based on your original ticket purchase. **If you qualify for free or discounted checked baggage**, this will be taken into account when you check in.

Sun 31 May 2015	DELTA: ITH || DTW		
CARRY ON	FIRST	SECOND	
FREE	\$25 USD	\$35 USD	

Sun 31 May 2015	DELTA: DTW || STL		
CARRY ON	FIRST	SECOND	
FREE	FREE	FREE	

Visit delta.com for details on baggage embargos that may apply to your itinerary.

June 5, 2015

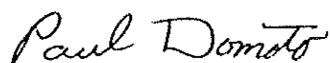
Bradley Beam
Enology Specialist
IGGVA

Dear Brad:

Listed below are my expenses to participate in the Vineyard Development and Business Planning Seminars held at Blue Sky Vineyard in Southern Illinois on June 1, 2015, and at Joliet Jr. College on June 3, 2015.

Item	Description	Expense
Travel	Round trip departing Ames, IA at 12:30 pm to Peoria, IL on May 30; to Peoria Airport on May 31; to Joliet, IL on June 2; and returning to Ames on June 3 arriving at 10:00 pm. 754 miles @ \$0.575/mi	433.55
Lodging	One night at the Peoria Super 8 on May 30 (e-mail on-line booking attached)	77.29
Meals	Dinner on May 30 and June 3 while in route	27.09
Total		\$ 537.93

Sincerely,



Paul Domoto
1917 George Allen Ave
Ames, IA 50010

Travel - SC 15

2381
6-11-15

Super 8 Peoria IL

1816 West War Memorial Drive,
Peoria IL 61614 United States
[View Map](#)

Check-in:
May 30, 2015,
2 PM
Check-out:
May 31, 2015,
11 AM

Room

Room Type: Standard
Room, 1 Queen Bed, Non
Smoking
This is a [Price Drop](#) room

1 adult
1 room, 1 night @ \$69.00 per night \$69.00
Tax charges & service fees \$8.29

Total: \$77.29

Guest

Guest1
Paul Domoto
(515) 231-3041
domoto@iastate.edu
Bed Type - 1 queen bed

Billing

Paul A Domoto
MASTERCARD *****3003
(exp 05/2017)
1917 George Allen Ave
Ames IA US 50010
domoto@iastate.edu

June 9, 2015

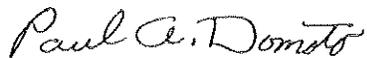
Illinois Grape Growers & Vintners Assoc.
2900 Greenbriar Dr., Suite 1
Springfield, IL 62704

Attn: Amy O'Keefe

My fee for participating in the Vineyard Development and Business Planning Seminars held at Blue Sky Vineyard in Southern Illinois on June 1, 2015, and at Joliet Jr. College on June 3, 2015.

Description	Expense	
Contractual speaker fee		\$2,000.00
Travel expenses:		
Mileage: Round trip departing Ames, IA at 12:30 pm to Peoria, IL on May 30; to Peoria Airport on May 31; to Joliet, IL on June 2; and returning to Ames on June 3 arriving at 10:00 pm. 754 miles @ \$0.575/mi	433.55	
Lodging: One night at the Peoria Super 8 on May 30	77.29	
Meals: Dinner on May 30 and June 3 while in route	27.09	
Total Travel Expenses:		537.93
Total:		\$2,537.93

Sincerely,



Paul A. Domoto
1917 George Allen Ave
Ames, IA 50010

Events

3150 South Rocky Comfort Road
Makanda, IL 62958



Today's Date

6/1/2015

Purchaser

IGGVA
2900 Greenbriar Drive
Springfield, IL 62704

Date of Event

Seminar
Monday, June 1, 2015

Item	Description	Qty	Price	Amount
Rental, Pavilion	Pavilion Rental		450.00	450.00
			Sales Tax (7.5%)	\$0.00
			Total	\$450.00
			Balance Due	\$450.00

Invoice No. 2015-037

Fax #	E-mail	Web Site
618-995-9763	info@BlueSkyVineyard.com	BlueSkyVineyard.com

2377
6-11-15
SOS

Joliet Junior College Food Service

**1215 Houbolt Rd.
Joliet, IL 60431-8938**

Invoice

Date	Invoice #
6/2/2015	16576

Bill To
Illinois Grape Growers & Vitners Ass 2900 Greenbrair Dr. Suite 3 Springfield, IL 62704. Attention: Bradley Beam

Number Expected:	Location	Function Date	Customer Acco...	Time
	T-1000	6/2/2015		

Qty	Description	Rate	Amount
	8:30am		
2	Coffee Regular 86 oz Pot (11 8oz cups)	7.95	15.90T
10	Hot Tea Bags with Hot Water	1.00	10.00T
2	Pitcher of ice water	0.00	0.00
	Lunch--12:30pm		
28	Box Lunch Assorted Meat *(Ham, Turkey, Roast Beef or Corned Beef) and Cheese Sandwiches made on White or Wheat Sub Rolls Fresh Fruit Cookies (brownies .25 additional cost) Potato Chips Bottle of Pop/Water Choose one Cheese--American Choose Toppings--Lettuce, Tomato Choose Your Spreads--Mayo/ Mustard on side	9.25	259.00T
2	Delivery Charge on Campus orders	5.00	10.00
	Sales Tax 8.75%	8.75%	24.93
		Total	\$319.83

Please make your check payable to Joliet Junior College Food Service and include a copy of your invoice with your payment. Thank you.

2380
6-11-15
SP 15

Sarah Bowman
1109 1/2 Walkup Ave.
Carbondale, IL 62901

INVOICE

DATE: JUNE 15, 2015

TO:
Illinois Grape Growers and Vintners Association
2900 Greenbriar Dr. , Suite 1
Springfield, IL 62704

FOR:
Vineyard Development and Business Planning
Workshops on June 1st and 3rd, 2015

Summary of workshop, attendance, etc: On June 1st and 3rd, I gave a Power Point presentation in southern and northern Illinois, respectively, on the topic of "Site and Variety Selection" to a group of about 25 to 30 new and experience grape growers. I focused first on the regional climate limitations to grape growing. Next, I focused on site specific characteristics, and how to select for superior characteristics, and how to utilize unique site characteristics, for example to avoid spring frost injury or enhance ripening of late maturing varieties. Finally, I discussed variety characteristics to select for based on growing region limitations and opportunities in the north, central, and southern regions of Illinois. The overall theme was to show growers how to understand regional climate characteristics, site specific characteristics, and how to select for varieties that fit their regional climate and utilize the unique characteristics of their site to fit the bud break, temperature preference, and ripening season characteristics of different grape varieties. I emphasized the importance of planning before planting, as grape growing is capital and management intensive, but there is profit potential for long-term committed growers who put thought and effort into their vineyard planning and management.

DESCRIPTION	AMOUNT
Contractual speaker fee	\$1500.00
Travel Reimbursement	pdch 2384 → \$377.78
TOTAL	\$1877.78

S.C.15
Chk 2416
6-20-15

Travel & Reimbursement Log

Name	Sarah Bowman	Rate Per Mile	\$0.575
Address	1109 1/2 Walkup Ave. Carbondale, IL 62901	For Period	From 6/2/15 to 6/3/15
Authorized By	Bill McCartney	Total Mileage	657
		Total Reimbursement	\$377.78

Date	Starting Location	Destination	Description/Notes	Mileage	Reimbursement
6/2/2015	Carbondale, IL	Best Western Joliet, IL	Drove from Carbondale, toured several vineyards, stayed night in Joliet	349	\$200.68
6/3/2015	Joliet Jr. College Joliet, IL	Carbondale, IL	Presented at Vineyard Development and Business Planning workshop at Joliet Jr. College. Drove back home to Carbondale, IL	308	\$177.10
Totals				657	\$377.78

Hotel Expenses:

Total:

Total Reimbursement: \$377.78

2384
6-11-15
SC-15
WORKSHOP

SINGLE ~ STEREO

DATE: June 12th, 2015
PROJECT: Vineyard Business Ads
THOUGHTFULLY PREPARED FOR:
Bradley Beam
Illinois Grape Growers & Vintners Association
2900 Greenbriar Dr., Suite 3
Springfield, IL 62704
(217) 726-8518 office

INVOICE:

HOURS/COST TO CLIENT
Rate: \$80/hr

Creation of print and web ads – 2.5 hours

\$200

Total: \$200

Make checks payable to:
Single Stereo LTD

Send payment to:
Kurt Bielema
1710 Pleasant St.
Groena, IL 61801

Terms: Net 15 days

singlestereo.com

creative@singlestereo.com
(217) 390-9060

1710 Pleasant Street
Groena, IL 61801

2015

2447
7-6-15

Sarah Bowman
Southern Illinois University
Dept of Plant Soil and Ag Systems
1205 Lincoln Drive
Carbondale, IL 62901-4415

INVOICE

DATE: JUNE 20, 2016

TO:
Illinois Grape Growers and Vintners Association
2900 Greenbriar Dr. , Suite 3
Springfield, IL 62704

FOR:
Viticulture Workshops:
May 24 – StarView Vineyards
June 1 – Galena Cellars
June 2 – Mackinaw Valley Vineyards

I prepared and delivered presentations on vineyard fertility and crop estimation, and also conducted demonstrations on soil and tissue sampling, and early season canopy management. The contractual fee represents 10 hrs of preparation time as well as 30 hrs of time devoted to the workshops themselves.

DESCRIPTION	AMOUNT
Contractual speaker fee (40 hrs @ 30.00/hr)	\$1200.00
TOTAL	\$1200.00

CB 2926
6-23-16
GC15
Workshop

Chris Lawlor
Galena Cellars
4746 Ford Road
Galena, IL 61036

INVOICE

DATE: JUNE 20, 2016

TO:
Illinois Grape Growers and Vintners Association
2900 Greenbriar Dr. , Suite 3
Springfield, IL 62704

FOR:
Viticulture Workshops:
May 24 – StarView Vineyards
June 1 – Galena Cellars

I prepared and delivered presentations the history of the Illinois Wine Industry, and how Galena Cellars has been maintaining relationships with growers for 30 years. The contractual fee represents 10 hrs of preparation time/workshop participation time.

DESCRIPTION	AMOUNT
Contractual speaker fee (10 hrs @ 30.00/hr)	\$300.00
TOTAL	\$300.00

*Chris 2916
6-23-16
SCIS
Workshop*

Michael White
ISU Extension & Outreach Viticulture Specialist
909 East 2nd Ave. Suite E
Indianola, IA 50125

INVOICE

DATE: JUNE 20, 2016

TO:
Illinois Grape Growers and Vintners Association
2900 Greenbriar Dr. , Suite 3
Springfield, IL 62704

FOR:
Viticulture Workshops:
June 1 – Galena Cellars
June 2 – Mackinaw Valley Vineyards

I prepared and delivered presentations on sprayers and sprayer calibration, and also conducted demonstrations on early season canopy management. The contractual fee represents 10 hrs of preparation time as well as 15 hrs of time devoted to the workshops themselves.

DESCRIPTION	AMOUNT
Contractual speaker fee (25 hrs @ 32.00/hr)	\$800.00
TOTAL	\$800.00

Note: Please make the check out to ISU Extension-Warren County.

*Chd 2922
6-23-16
SC 15
Workshops*

Allan Hyland
Galena Cellars
4746 Ford Road
Galena, IL 61036

INVOICE

DATE: JUNE 20, 2016

TO:
Illinois Grape Growers and Vintners Association
2900 Greenbriar Dr. , Suite 3
Springfield, IL 62704

FOR:
Viticulture Workshops:
May 24 – StarView Vineyards
June 1 – Galena Cellars

I prepared and delivered presentations on canopy management and pest and disease management, specifically as it pertains to young vineyards. I also prepared and delivered information regarding the Northern Illinois Wine Growers trial vineyards, and led a tour/discussion of the trial. The contractual fee represents 15 hrs of preparation time/workshop participation time.

DESCRIPTION	AMOUNT
Contractual speaker fee (15 hrs @ 30.00/hr)	\$450.00
TOTAL	\$450.00

*CA 2914
6-23-16
SC 15
workshops*

Bradley Beam
6855 N. Fox Point Dr.
Peoria, IL 61614
Galena, IL 61036

INVOICE

DATE: JUNE 20, 2016

TO:
Illinois Grape Growers and Vintners Association
2900 Greenbriar Dr. , Suite 3
Springfield, IL 62704

FOR:
Viticulture Workshops:
May 24 – StarView Vineyards
June 1 – Galena Cellars
June 2 – Mackinaw Valley Vineyards

I organized this event, including recruitment of speakers, determination of content, and delivered and organized presentations as part of the workshop. The contractual fee represents 12 hrs of preparation time as well as 16 hrs of time devoted to the workshops themselves.

DESCRIPTION	AMOUNT
Contractual speaker fee (28 hrs @ 30.00/hr)	\$840.00
TOTAL	\$840.00

*818.30 to
SC15*

*Card 2915
6-23-15
SC 15
Workshops*

Project Title:

“Illinois.....Where Fresh Is”

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

Partner Organization: CBS
Community Partnership Division



Project Summary:

- According to a March 2013 IDOA press release Illinois Specialty Crops industry sales total \$392 Million, with more than 101,000 acres of Illinois farmland are devoted to growing specialty 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 specialty crops is a top priority.
- The “Illinois Where Fresh Is” campaign is important because through the power of sight, sound, motion and emotion it educated and encouraged consumers to buy locally produced Specialty Crops hence changed purchasing habits. This behavior resulted in keeping more monies in the State and enhanced the competitiveness and sale of Specialty Crops which is our main objective. Our project also encouraged a healthier life style by educating people to make more nutritional choices while simultaneously stimulating the purchase of Specialty Crops.



Project Purpose:

- 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 May, June, July and August when the Specialty Crops we featured were at their peak in Illinois.
- The project complimented our previous campaigns which ran in the springs and summers of 2010, 2012-14, by reinforcing the important message among the core foundation of consumers already acquainted with the initiative and greatly increased awareness of the important message to buy nutritious, locally grow Specialty Crops among new shoppers.



Project Activities:

- The CBS Community Partnership Division executed a transmedia 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) were contributed in kind by the CBS Community Partnership Division.
- The CBS Community Partnership Division worked together with the IDOA to promote the Specialty Crop program and educate 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.illinoiswhererefresis.com for more information.
- Collaborating with the IDOA we created a pre and post campaign survey to assess peoples knowledge of Specialty Crops.



Project Activities:

- The grant agreement required the below elements which have been delivered:
 - 2x :30 television vignettes
 - 1x :05 television vignette
 - 1x :15 television vignette
 - All digital production including skins, pencil push down, pre roll and banners
 - Outdoor production and installation of 4 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

- 207x :30 vignettes
- 105x :15 vignettes
- 36x :05 vignettes
- 348x Total

Results

- 280x :30 vignettes
- 103x :15 vignettes
- 40x :05 vignettes
- 423x Total

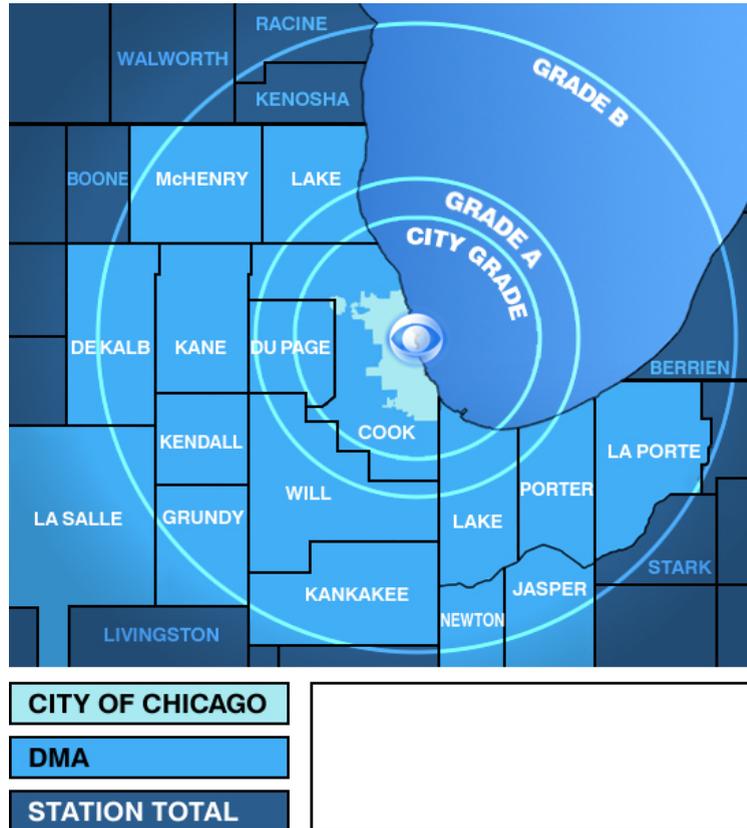


- 22,245,000* Adult 18+ impressions 22,326,000 Adult 18+ impressions
 - Television impressions delivered at 104%, an additional 81,000 impressions!*
 - CBS 2 TV ran an extra 75 vignettes, delivering at a 122% of the contract!*
- Highlights of the campaign include vignettes that were upgraded to David Letterman's finale week and the Stanley Cup Champions LIVE, history making Blackhawks parade!

*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

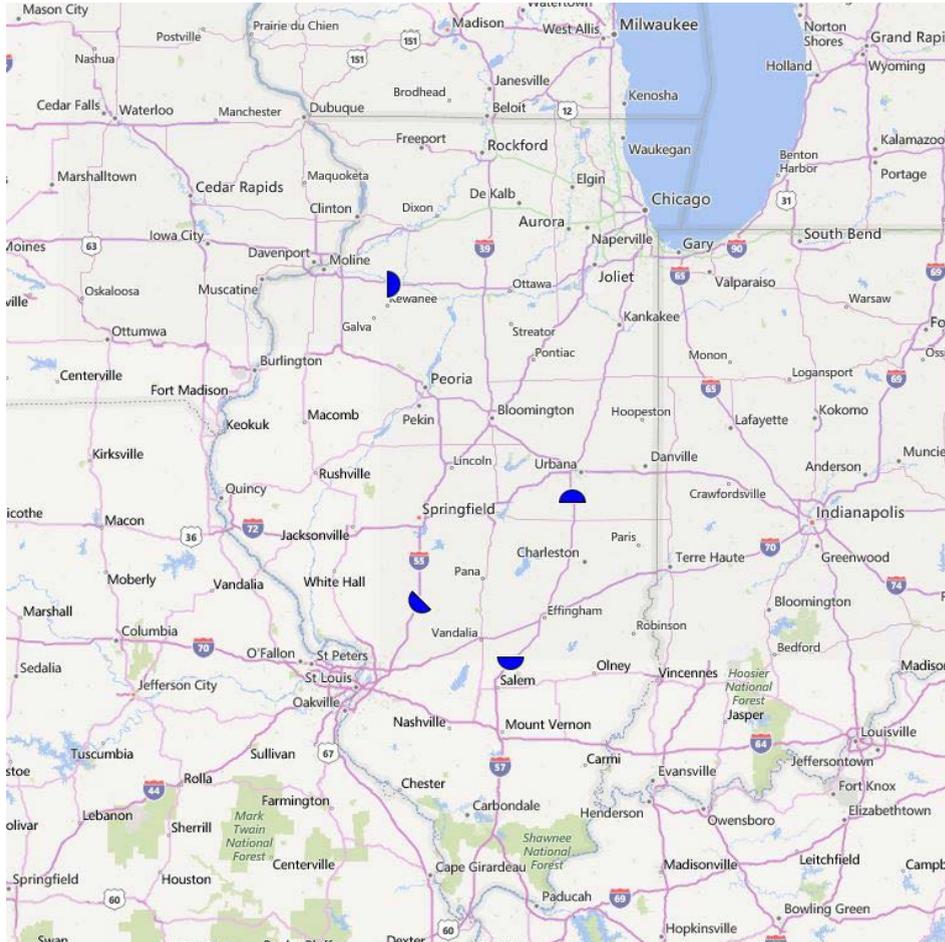


Goals and Outcomes Achieved- Outdoor:

- The outdoor component of our agreement included 4 billboards posted beginning in May of 2015. We selected four outdoor locations to coincide with the 5 zones the IDOA targeted with their cable campaign. We guaranteed 1,250,000 adults 18+ impressions (including duplication) and have delivered 3,576,050 impressions because as of 10-6-15 two of the 4 boards are still up at no cost! A bonus 873,950 impressions, we value your partnership.

Face #	Description	Lat.	Long.	Media Size	Posting Market	Scheduled Dates	Scheduled Days	Showing Days	Override Days	Area	Media	OOH Rating	DEC (000's)	Campaign Impressions
000092B-O	I-57 3.6 mi S/O Hwy 185 W/S	38.806183	-88.831253	16'x48'	Mid West Non-Metro	5/25/2015 - 6/21/2015	28	131	103	Marion County, IL	Bulletins	58,361	9.28	1,092,184.43
000875B-O	I-55 5.5 mi S/O Hwy 108 W/S	39.209126	-89.659363	20'x80'	Mid West Non-Metro	5/25/2015 - 6/21/2015	28	131	103	Montgomery County, IL	Bulletins	107,729	17.38	2,016,071.29
009921A-O	E/S I-57, 4.8 mi S/O Airport Rd	39.951714	-88.300278	20'x60'	Mid West Non-Metro	5/25/2015 - 6/21/2015	28	32	4	Champaign, IL	Bulletins	102,330	11.04	467,794.29
008050B-O	S/S I-80, .6 mi E/O Hwy 78	41.401249	-89.892441	10'6x36'	Mid West Non-Metro	6/1/2015 - 6/28/2015	28	28	0	Henry, IL	Bulletins	54,612	7.84	218,448.00
														3,576,050.00

Goals and Outcomes Achieved 2015:



Legend



Bulletins

Outdoor:

Illinois Dept. of Agriculture / Specialty Crops 2015

Face # 000092B-0 - I-57 3.6 mi S/O Hwy 185 W/S



Photo taken on: 6/11/2015

Face Information

Media:	Bulletins	Posted Date:	5/28/2015	Design:	Dept. of Agriculture
Area:	Marion County, IL	Covered Date:	n/a	First Received On:	n/a
Posting Market:	Mid West Non-Metro	Showing:	131	Last Received On:	n/a
Direction:	N				
Illumination:	18 hours				
DEC (000's):	9				
OOH Rating:	58,361				



OUTFRONT Media hereby certifies the accuracy of this electronically generated report, which may be relied on as if it were signed by hand and attested to by a duly authorized signatory.

Outdoor:

Illinois Dept. of Agriculture / Specialty Crops 2015

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



Photo taken on: 6/11/2015

Face Information

Media:	Bulletins	Posted Date:	5/28/2015	Design:	Dept. of Agriculture
Area:	Montgomery County, IL	Covered Date:		First Received On:	n/a
Posting Market:	Mid West Non-Metro	Showing:	131	Last Received On:	n/a
Direction:	NE				
Illumination:	18 hours				
DEC (000's):	17				
OOH Rating:	107,729				



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BMS.net Proof of Performance
by **avuda**

Page 4 of 6
Generated on: 10/6/2015

got
proof?

Outdoor:

Illinois Dept. of Agriculture / Specialty Crops

2015

Face # 009921A-0 - E/S I-57, 4.8 mi S/O Airport Rd



Photo taken on: 5/30/2015



Photo taken on: 5/30/2015

Face Information					
Media:	Bulletins	Posted Date:	5/29/2015	Design:	Dept. of Agriculture
Area:	Champaign, IL	Covered Date:	6/30/2015	First Received On:	n/a
Posting Market:	Mid West Non-Metro	Showing:	32	Last Received On:	n/a
Direction:	S				
Illumination:	18 hours				
DEC (000's):	11				
OOH Rating:	102,330				



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BMS.net Proof of Performance
by **ayuda**

Page 5 of 6
Generated on: 10/6/2015



Outdoor:

Illinois Dept. of Agriculture / Specialty Crops

2015

Face # 008050B-0 - S/S I-80, .6 mi E/O Hwy 78



Photo taken on: 6/13/2015



Photo taken on: 6/13/2015

Face Information					
Media:	Bulletins	Posted Date:	6/1/2015	Design:	Dept. of Agriculture
Area:	Henry, IL	Covered Date:	6/29/2015	First Received On:	n/a
Posting Market:	Mid West Non-Metro	Showing:	28	Last Received On:	n/a
Direction:	W				
Illumination:	18 hours				
DEC (000's):	8				
OOH Rating:	54,612				



OUTFRONT Media hereby certifies the accuracy of this electronically generated report, which may be relied on as if it were signed by hand and attested to by a duly authorized signatory.

Goals and Outcomes Achieved-Digital:

- Campaign Ad Units Publisher: CBSChicago.com (incl. radio.com)
- 300x250 medium rectangle
- 728x90 leaderboard
- 2x2 video pre-roll
- Background Skin & Pencil Pushdown

Delivery Report:

Total Impressions delivered:

2,066,432

Total Clicks: 6,600

Average CTR: 0.32 %

CTR by ad unit:

pre-roll avg CTR 2.6%

page takeover CTR 0.7%

300x250 banner 0.05%

728x90 banner 0.04%



Pre/ Post Survey Analysis:

<u>Pre- Post Survey Analysis 2015:</u>	<u>May-15</u>	<u>Jul-15</u>	<u>% Change</u>
total number of people surveyed	225	248	10%
Total number of people who recognized the log	118	127	8%
Total number of people who recognized the logo on TV	94	104	11%
Total number of people who recognized the logo on Outdoor	6	8	33%
Total number of people who recognized the logo on Digital	7	14	50%

Key Take-a-ways

- People are excited to participate in the survey
- There is significant recognition of the Illinois Where Fresh is Logo
- 40% of those surveyed responded that being a locally grown specialty crop was a very important determinant when purchasing fruits and vegetables



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:
 - 22,326,000 duplicated adults 18+ via television; according to Nielsen
 - 2,066,432 impressions on cbschicago.com
 - 3,576,050 Adults 18+ impressions via outdoor (includes duplication)



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 (666,000), 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 \$3.3M of incremental dollars! That's over \$3.3 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) The project was executed without and problems or delays. If a media component was pacing behind regarding deliveries we immediately addressed the short fall to ensure all deliverable we fulfilled upon completion.



Additional Information:

2015 Illinois Specialty Crop Grant Program

Budget Information

Expenditure	Category	Invoice Number	Amount on Invoice Charged Against Grant	Amount of In-Kind Contributions	Total
Television vignette production 2x :30	other			\$ 30,000.00	\$ 30,000.00
Television vignette production 1x :05 ID	other			\$ 3,500.00	\$ 3,500.00
Television vignette production 1x :15	other			\$ 10,000.00	\$ 10,000.00
Internet production	other			\$ 500.00	\$ 500.00
Outdoor production/ installation	other			\$ 3,500.00	\$ 3,500.00
4 CBS Outdoor Billboards- Mkts TBD	other		\$ 5,000.00		\$ 5,000.00
CBSChicago.com- 1,295,000 guaranteed impressions	other		\$ 20,000.00		\$ 20,000.00
CBS 2 TV (207x :30/105x :15/36x :05) to run in News etc.	other		\$ 85,000.00	\$ 12,800.00	\$ 97,800.00
Media buying/ execution	other			\$ 15,000.00	\$ 15,000.00
Materials Distribution	other			\$ 1,000.00	\$ 1,000.00
Potential thrid party tie ins	other				\$ -
					\$ -
					\$ -
					\$ -
TOTAL			\$ 110,000	\$ 76,300	\$ 186,300

Contact Person:

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

SC-15-09

Final Grant Progress Report

Project Title

Increasing Illinois specialty crop production and sales through a season extension workshop, guide, and infographic

Partner Organization

The Land Connection
505 West University Avenue, Suite 203
Champaign, Illinois 610821

Project Summary

The Land Connection increased specialty crop growers' knowledge of a broad range of season extension tools and techniques, including cultivar selection, row covers, low and high tunnels, and long-term storage.

We accomplished this by (1) holding an intensive three-day training in central Illinois where farmer participants heard from local experts in a classroom setting, toured local farms that are practicing season extension techniques, and participated in moving a high tunnel at the University of Illinois Sustainable Student Farm; (2) developing a detailed guide to season extension practices that includes three case studies and video interviews with successful farmers, and is available through our website and social media platforms; and (3) by developing a compelling infographic that serves as a visual shorthand for season extension options and helps guide growers to appropriate implementation decisions, and is available as a download on our website and through our social media channels.

Project Purpose

The purpose of this project was to provide Illinois specialty crop growers with the knowledge, experience, and confidence they need to successfully implement appropriate season extension practices on their farms. Illinois specialty crop growers gained theoretical knowledge of season extension principles using the guide and infographic that we developed, and practical knowledge of these principles through our three-day workshop.

The specific issues addressed by this proposal was the relatively short season for fruit and vegetables grown in Illinois, and the knowledge, experience, and confidence barriers many specialty growers face when they consider implementation of season extension practices. It is important to address these issues because Illinois consumers spend nearly \$15 billion annually on fruits and vegetables, yet imports account for over 95% of those sales.¹ During the winter months, these imports increase and come from even greater distances. Season extension

¹ "Ready to Grow: A Plan for Increasing Illinois Fruit and Vegetable Production", 2010: <http://www.familyfarmed.org/wp-content/uploads/2010/07/IllinoisProduceReport-final.pdf>

practices and infrastructure can increase the production and consumption of Illinois specialty crops, increase growers' income, and reduce the amount of food that must be imported from other states and countries.

This project is particularly timely as state institutions attempt to reach the Illinois Food, Farms, and Jobs Act goal of 20% purchasing of local foods by 2020.² The project is also timely as Illinois universities, restaurants, grocery stores, and consumers increasingly seek local foods, while Illinois producers have generally not been able to meet the demand, especially from November through June.

The project is also timely because of the synergies with the USDA NRCS Environmental Quality Incentive Program (EQIP) seasonal high tunnel initiative,³ which provides funding for high tunnels to eligible growers. Although EQIP funded 162 seasonal high tunnel projects in Illinois from 2010 to 2013⁴, many more of the approximately 3,200 Illinois specialty crop growers have not yet taken advantage of this program, and even those who have may not yet have the knowledge to truly optimize their fruit and vegetable production.

The season extension knowledge and training provided by this project helped Illinois specialty crop growers meet the increasing demand for Illinois-grown specialty crops by increasing total volume of production, and by having crops more consistently available throughout the year. It also will help Illinois consumers to purchase more food grown in Illinois, increasing the viability of Illinois specialty crop farmers. Some season extension practices can also improve product quality and quantity by reducing pest, weed, and disease pressure. Finally, the project is timely, as climatic events, like the current drought in California, and increasingly unpredictable weather in general, expose vulnerabilities and increases the need for local production and resilience.

Although previous projects funded by the SCBG have explored aspects of high tunnel use,⁵ this project expanded upon the previous work by broadening the concept of season extension beyond just plasticulture, by providing intensive training, including farm tours and a hands-on hoophouse moving. It also created two online resources aimed specifically at Illinois specialty crop growers. This project also builds upon two of The Land Connection's previous SCBG awards⁶, one of which involved creating and disseminating an infographic, and both of which involved the use of social media to do outreach to a target audience. What we learned in those two previous grants will help us successfully complete this project.

² Illinois Local Food, Farms, and Jobs Act, purchasing goals established for Illinois products. www.ilga.gov/legislation/ilcs/ilcs3.asp?ActID=3137&ChapterID=7

³ USDA NRCS EQIP High Tunnel program:

http://www.nrcs.usda.gov/wps/portal/nrcs/detail/ri/home/?cid=nrcs144p2_016514

⁴ Email communication from Eric Gerth, USDA Natural Resources and Conservation Service, April 29, 2014

⁵ Previous SCBG-funded projects related to season extension include: a 2010 grant to Peasant's Plot in Chicago to demonstrate growth under high tunnel protection versus without protection; a 2010 grant to Spring Valley Farm and Vineyard that integrated drip irrigation and fertilizer injection systems; and a 2011 grant to the Board of Trustees of the University of Illinois to research and demonstrate practices that are critical to appropriate high tunnel management.

⁶ SC-13-06 and SC-14-06

The intensive workshop on season extension may become self-sustaining if we are able to recruit a sufficient number of farmers and charge a fee that is low enough to be affordable to the farmers, while high enough to cover the costs of the workshop. If we are successful, then the incoming tuition will cover the costs of the training in its entirety, and we would then be able to export this training curriculum and model to other regions of Illinois. In the future, now that the season extension guide and the infographic are developed, will require only minimal maintenance costs, and will be self-sustaining and continue to provide Illinois specialty crop growers with season extension information far into the future.

Project Activities

There were three primary outputs of this project:

- 1) We developed and held a comprehensive three-day season extension training in the fall of 2015.
 - Day 1: The Land Connection farmer training program manager worked with area experts and presented the overarching principles and the wide range of practices for season extension in the classroom at Prairie Fruits Farm & Creamery in Champaign, Illinois.
 - Day 2: Attendees toured Blue Moon Farm, Autumn Berry Inspired, and the Common Ground Food Co-op, which are farms and businesses that successfully utilize various season extension systems and are successful at marketing Illinois specialty products beyond their normal growing season.
 - Day 3: As the culmination of the three-day training, participants went the Student Sustainable Farm at the University of Illinois and participated in moving a high.
 - **12 specialty crop farmers attended the workshop in person.**

- 2) We developed a 49 page downloadable season extension guide. We took advantage of existing research, in-house knowledge, and the knowledge of our partners at the University of Illinois and U of I Cooperative Extension, and the advice of experienced Illinois growers who have years of experience successfully using season extension practices. We also interviewed three farmers who use season extension practices, and worked with a professional videographer to video the interviews and make them available on our website and YouTube channel. The comprehensive guide reached farmers through The Land Connection website and our social media channels, and included information on the following topics:
 - Crop and variety selection and diversification
 - Storage and cellaring
 - Forcing
 - Plasticulture
 - Off-season marketing and enterprises
 - Practical guidance to help growers decide if, and how much, season extension is right for their operation
 - Three case studies with farmers who use season extension practices on their farms

- **The guide was downloaded 88 times in the first six weeks it was available**
 - **Social media impressions of the guide and infographic - 12,144**
 - **Engagement with social media posts of the guide and infographic- 485**
 - **The videos were viewed 4795 times on our YouTube channel and website**
- 3) We developed a downloadable, printable, and social media-friendly season extension infographic, which was developed by a graphic designer. The compelling infographic serves as visual shorthand to provide at-a-glance information on season extension options for Illinois specialty crop farmers, and helps guide them to appropriate decisions about season extension practices for their farms:
- **The infographic was downloaded 112 times**
 - **Social media impressions of the guide and infographic - 12,144**
 - **Engagement with social media posts of the guide and infographic- 485**

Goals and Outcomes Achieved

Output 1: Intensive three-day season extension training workshop with classroom, tour, and hands-on experiential learning elements

- **Performance Measure 1:** Number of intensive workshops held (**target = 1, actual = 1**) and number of specialty crop farmers participating in the intensive workshop, as measured by attendance (**target = minimum of 25 in this pilot year, actual = 12**). While we did not meet our target for this performance measure, our survey of the farmers that did attend indicated that the hands-on elements of the workshop were of particular interest. We will use the survey data to improve the workshop in the years to come. We anticipate that demand for the season extension workshop will continue to grow, and that more Illinois specialty crop farmers will be served in each subsequent year at greater numbers attend each workshop.
- **Performance Measure 2:** Percentage of attendees who report that they have increased their knowledge of a broad range of season extension techniques (**target = 90%, actual = 100%**), as measured by pre- and post- workshop surveys. All workshop participants responded in post-workshop surveys that they increased their knowledge of season extension techniques.
- **Performance Measure 3:** Percentage of attendees who have applied, or have concrete plans to apply, the knowledge they gained at the workshop to their own farm operation (**target = 30%, actual = 85%**), as measured by pre- and post-workshop surveys. Our post-workshop surveys indicated that 85% of workshop participants plan to apply the knowledge they gained at the workshop to their own farm operation. Because of the weather delay for the original date of the workshop, we were not able to conduct phone interviews and end-of-season surveys that would provide useful mid-range outcome data. We plan to collect this data in the spring of 2016.

Output 2: Downloadable season extension guide for Illinois specialty crop growers, including a broad range of season extension information and practices, and case studies of Illinois specialty crop growers using some of those practices

- **Performance Measure:** Number of season extension guides produced (**target = 1, actual =1**), number of hits on that page of The Land Connection's website in the four months after the guide is finished and uploaded (**target: 800, actual =387**), and number of downloads of the guide (**target: 200, actual =88**), as measured using Google analytics and other software. Because the guide was released later than we anticipated, the number was lower, but we anticipate this number will continue to rise.

Output 3: Infographic to provide at-a-glance information about season extension options, helping specialty crop growers make appropriate season extension decisions and access further resources

- **Performance Measure:** Number of season extension infographics produced (**target = 1, actual = 1**), number of hits on that page of The Land Connection's website in the nine months after the tool is uploaded (**target= 800, actual = 387 downloads = 112**), and number of social media impressions (**target = 45,000, actual = 12,144**). The response to the materials has been very positive, and we expect that the numbers will continue to increase.

We shared, and will continue to share, the season extension curriculum, guide, and infographic through our many existing publicity avenues, including our Weekly Harvest newsletter, website, social media platforms (Instagram, Twitter, Facebook, Pinterest), and at conferences and professional meetings like the Illinois Specialty Growers Conference in January 2016. In addition, we will disseminate the outputs of the project through our collaborating partners, including experts from the University of Illinois, USDA NRCS local offices, the Central IL Sustainable Farming Network (385 members), Central Illinois Buy Fresh Buy Local (over 300 members), the Illinois Farmers Market Association (also over 300 members), and the Southern Illinois Farming Network (80 members at last count).

Beneficiaries

The **specialty crop beneficiaries** of this project were, and will continue to be a broad spectrum of new and existing growers throughout Illinois and the Midwest region. Of the approximately 3,200 specialty crop farms in Illinois, **12 farmers participated in the three-day workshop**, and **200 people downloaded the guide and/or the infographic**, in the first six-weeks it was offered, and **4795 people viewed the videos**, increasing their knowledge of season extension practices, and the likelihood that they will implement appropriate season extension techniques to increase their production and sales, and ultimately enhance the overall competitiveness of Illinois specialty crops. The guide, infographic, and videos will continue to be available to specialty crop farmers on The Land Connection's website indefinitely.

Benefits from implementing season extension techniques include increased, possibly year-round, income, retention of current customers over a greater length of time, gain in new customers, and higher prices at times of the year (early and late in the growing season) when other growers (those with only unprotected field crops) do not have produce available. Other potential benefits of season extension practices are high yields and better quality, particularly for berry crops. In addition, with year-round production, growers can provide extended or year-

round employment for skilled employees. By successfully extending their growing season, Illinois specialty crop farmers can grow more and different crops for longer periods of time, reach more markets, create more consistent revenue streams, and increase the viability of their businesses. In addition to the Illinois specialty crop farmers who are direct beneficiaries of this project, indirect beneficiaries include farm family members, community members, consumers, and local institutions wishing to purchase locally grown specialty crops.

Lessons Learned

The main obstacle that we encountered during this project was in scheduling the three-day workshop. We initially scheduled the workshop for early March, but there was an ice-storm that resulted in us having to cancel the workshop for safety reasons. We rescheduled the workshop for October, which worked out well for the class (perfect weather for farm tours and the hands-on component), but put us behind in meeting our goals for the number of farmers reached by the end of the grant period. I have no doubt, however, that farmers will continue to access the excellent materials that we developed and made available online.

Contact Person

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Additional Information

The links to the infographic and the season extension guide that we developed are here:

Infographic: <http://thelandconnection.org/sites/default/files/TLCInfographic.pdf>

Season Extension

Guide: http://thelandconnection.org/sites/default/files/TLCSeasonExtensionGuide-forweb_0.pdf

Videos of Farmer Interviews: https://www.youtube.com/channel/UCmz-MjufoEh_fyNifvOxzgA

Or

<http://thelandconnection.org/farmers/farmer-training-intensives/season-extension/season-extension-resource-page>

2015 Illinois Specialty Crop Grant Final Report

SC-15-10

Project Title:

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. This three phase project, which started in 2013, has enhanced consumer awareness and demand for Illinois specialty crops through a cohesive promotional effort to help identify and advertise these products. This program has begun to clear blocks regarding the labeling of Illinois grown and has opened up market branding for Illinois growers with the “Illinois...Where Fresh Is” tagline across the state.

Through a joint effort with CBS Community Partnerships in Chicago, a past Specialty Crop Block Grant recipient, the department has successfully focused on marketing the specialty crop industry through colorful, interactive television/online commercials and billboards branded with the “Illinois...Where Fresh Is” tagline.

Phase 1 focused on building upon existing paid advertising through the CBS Community Partnerships project and expanded coverage to include cable advertisements in Central and Southern Illinois that complimented CBS’s billboard messaging. The project identified 200 grocery stores and 100 farmers’ markets across the state through a qualification process to begin displaying point of sale material that included a starter pack consisting of one 3 X 6 vinyl banner and one roll of 1,000 product stickers to brand Illinois-grown fresh fruits and vegetables with the “Illinois...Where Fresh Is” logo. However, only 150 grocery stores and 75 farmers’ markets applied for the promotional materials.

In 2014, Phase 2 aimed to increase the number of grocery stores and farmers’ markets involved in the program. The proposal targeted 75 additional retail stores, 25 additional farmers’ markets and broadened its scope to include 25 roadside stands. Magnetic bumper stickers with the “Illinois...Where Fresh Is” logo were provided to the stand owners to help them brand their products as they traveled. Because many of these operations sell products from their vehicles and do not have large display areas, the removable magnetic stickers allowed them to participate in the program in a non-traditional way. Seventy-seven additional kits were distributed, bringing total participation in the campaign to 302. The new, 2014 participants included 43 retail stores, 16 farmers markets and 18 roadside stands. An increase also was recorded in the number of “Where Fresh Is” logo applications. The department received an additional 20 applications during the year, raising the total to 306.

Phase 3, in 2015, sought to strengthen awareness of the “Illinois...Where Fresh Is” logo through a statewide, paid advertising campaign in seven geographic regions (Bloomington/Champaign, Carbondale, Mt. Vernon/Belleveille, Peoria, Rockford, Springfield/Effingham and Quincy). The campaign also promoted a Buy Illinois Fruits and Vegetables Challenge to encourage consumers to dedicate at least \$10 of their existing grocery budget towards the purchase of Illinois-grown fruits and vegetables. If every household in Illinois (4.7 million) would participate in the challenge, more than \$2.4 billion would be generated annually for local economies.

Project Approach:

The Illinois Department of Agriculture continued working with CBS Community Partnerships in Phase 3 by sharing advertising content. CBS produced three commercials highlighting specific Illinois specialty crops: 1) berries, 2) peaches and watermelon, and 3) sweet corn. In addition to the paid outreach efforts, the Illinois Farmers’ Market Association, Illinois Food Retailers Association and Illinois Farm Bureau promoted the “Illinois...Where Fresh Is” campaign on a grassroots level and helped disseminate information through their memberships to further expand outreach.

Goals and Outcomes Achieved:

Phase 3 paid for outreach efforts to educate additional retail stores, farmers’ markets and farm stands about the promotional materials. Cable ads were placed outside the Chicago metropolitan area already covered through the CBS ad buys. Spots ran over a period from mid-June through August in the seven targeted areas.

Highlights of the campaign include: 337,365 consumers reached in the Bloomington/Champaign market through the airing of 949 spots; 55,962 consumers reached in the Carbondale market through the airing of 2,187 spots; 159,168 consumers reached in the Mt. Vernon/Belleveille market through the airing of 552 spots; 327,330 consumers reached in the Peoria market through the airing of 946 spots; 49,554 consumers reached in Rockford through the airing of 686 spots; 363,978 consumers reached in the Springfield/Effingham market through the airing of 1,195 cable spots and placement of 38,460 mobile spots; and 36,054 consumers reached in Quincy through the airing of 5,067 spots.

A page on the Illinois Department of Agriculture website includes a listing of all “Illinois...Where Fresh Is” program participants so that consumers looking for fresh fruits and vegetables can find vendors online. To increase specialty crop consumption, the cable ads encouraged consumers to visit the page and nearly 21,000 did so during the campaign. This figure represents a three-fold increase in traffic on the site compared to the number of visitors in the four months immediately preceding the campaign. The page remains online to educate consumers about the Buy Illinois Fruit and Vegetable Challenge, which provides them an incentive to purchase Illinois-grown fruits and vegetables because such purchases potentially can have a profound impact on their local economy.

Beneficiaries:

Illinois grocery stores, farmers markets, roadside farm stands, consumers and specialty crop growers all benefited from this project. The 193 retailers, 91 farmers markets and 18 roadside stands that participated benefited from the free point of sale materials that were distributed as well as the subsequent advertising, the online promotional efforts of the Illinois Department of Agriculture and the increased awareness of Illinois-grown specialty crops. Consumers benefited from the educational information about Illinois specialty crops in the media buys. In Phase 3 alone, the branding campaign blanketed downstate Illinois with 11,582 cable ads and reached 1,367,871 people with its message. Lastly, the specialty crop industry as a whole also benefited. Because of the advertising, point of sale displays and call to action, more consumers now recognize and shop for the Illinois-grown brand, which has created new markets for farmers and increased demand for their products. The "Illinois...Where Fresh Is" banners still are in use, and the department continues to receive requests for product stickers. Wal-Mart, for example, plans to feature the "Illinois...Where Fresh Is" logo on the melon boxes that will be in its stores. The growing Illinois specialty crop market has even prompted the department to work with USDA Market News on expanding its coverage of crop prices to include common specialty crops.

Lessons Learned:

Awareness of specialty crops is growing among consumers due to the local foods movement and projects like "Illinois...Where Fresh Is." This heightened awareness positively impacts Illinois communities and helps specialty crop farmers increase their production and sales.

Targeting geographic regions with specific information about the availability of local specialty crops helps drive their economies. As consumers begin to understand the benefits of "shopping local," they will increasingly look for the Illinois brand.

While there is value in providing customers with information about where their food comes from, more educational efforts are needed beyond this project. In fact, the key to the long-term success of the initiative likely will depend more upon the acceptance and adoption of the logo by retailers in the marketplace than the awarding of additional grant funds.

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Name of Recipient

University of Illinois at Urbana-Champaign

Project Title

Nano-encapsulated Thiamine Dilauryl Sulfate for Control of Fungal Pathogens Related to Horseradish Root Discoloration

Project Summary

Horseradish is grown for its thick, white, pungent roots, which are used in the manufacture of various condiments. Illinois is the leading producer of horseradish in the United States, supplying over 50% of American demand. Horseradish is often attacked and damaged by several pathogens and insects when effective control measures are not applied. The internal discoloration of horseradish roots caused by pathogenic fungi is the main limiting factor in production. Yield losses of up to 100% by internal root discoloration have occurred frequently in Illinois. Preventing it has been a challenging task because the usual pathogens are carried in sets (set-borne inoculum) and survive in the soil (soil-borne inoculum). A number of measures such as soil fumigation and seed disinfection have been tried. However, these measures have been reported as ineffective or costly. Moreover, many countries have recognized the need for eco-friendly fungi treatments.

The purpose of this study was to investigate the use of thiamine dilauryl sulfate (TDS), a vitamin-B1 derivative, as an antifungal agent. TDS is a new surfactant developed by PI Feng's lab in recent years. Feng and coworkers have shown that a combined treatment of TDS and malic acid can achieve greater than a 5 log reduction of E. coli O157:H7 populations on lettuce, spinach, and meat products. Research conducted by Chao et al. (2013) showed that TDS is an effective inhibitor of Fusarium sp. under laboratory conditions. TDS has not been tested on horseradish sets in the U.S. for the control of fungi. In this study, we used nano-encapsulation technology to control its release and target its delivery.

Three fungi were isolated from discolored horseradish roots. To test its ability to inhibit the fungus, nano-TDS was prepared by mixing it with soluble soy protein isolate (sSPI) under ultrasonication. The fungus was incubated on potato dextrose agar (PDA) containing TDS, TDS nanoparticles, or dazomet (a commercial fungicide) at 25°C for 12 days. Scanning electron microscopy (SEM) was used to examine the morphological changes of the spores. The stability of the nano-TDS was examined by monitoring particle sizes at different temperatures for 3 months.

The two fungi isolated from the discolored horseradish roots were identified as Fusarium sp. and Fusarium solani by 16s rRNA sequencing. Growth of the Fusarium sp. on media with 600 ppm of each added chemical was TDS >nano-TDS > dazomet, in descending order. For the Fusarium solani, there were no differences between the TDS and nano-TDS, but almost no fungus grew on the PDA containing dazomet. The spore germination inhibition and mycelia inhibition of the fungi were similar. Inhibition of Fusarium sp. spore germination was 97%, 75%, and 52%, in the presence of 600 ppm of dazomet, TDS nanoparticles, and TDS, respectively. For the Fusarium solani, even 200 ppm of dazomet was able to inhibit 98% of the spore germination. One thousand ppm of TDS or TDS nanoparticles were able to inhibit 100% and 96%, respectively. The SEM showed severe spore damage including disruption and shrinkage. The particle sizes and concentrations of the nano-TDS stored at 4°C and 25°C were changed slightly. At 35°C, the particle size increased significantly, and the TDS concentration decreased by over 50%. The effect of the TDS was checked by the number of fungal sets growing on the PDA. At 4°C, the fungal growth of the sets treated with nano-TDS was slightly less than that of the untreated ones. However, there was no significant difference between the treated and untreated cultures at 25°C.

Project Approach

1. Isolation of fungi related with horseradish internal discoloration

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The internal discolored horseradish root was cut, peeled and sterilized to isolate the fungi related with the disease. Each surface-sterilized root was placed onto potato dextrose agar and incubated at 24 ± 1 C° for 15 days. Three different fungi from the discolored were isolated and examined by optical microscope. Observing the spore shape under the optical microscopy, two fungi were likely to *Fusarium* sp. and other one fungus seemed to be *Verticillium* sp. Three fungi isolated from discolored horseradish root were analyzed with 16s rRNA sequencing. Two fungi were identified as *Fusarium* sp. and *Fusarium solani* and the other one was identified as *Colletotrichum coccode* which was not related with horseradish disease. Two *Fusarium* species were used in this study.

2. Production of TDS nanoparticles and encapsulation

The usage of TDS had been limited because of the low solubility (0.021% in water at 25C). To efficiently enhance the inhibition effect on the mycelial growth of fungi related with the discolored horseradish as well as the increase of TDS solubility, TDS was nano-complexed with soluble-SPI. Emulsifying properties of soy protein can be improved by the treatment of pH-shifting combined with ultrasonic power. Soluble soy protein isolates (sSPI) made by pH-shifting combined with ultrasound can complex with the lipophilic long chain of TDS and it was finally increased the solubility of TDS in hydrophilic condition. Two different methods for preparing nano-TDS were used in this study. First, 1ml of 40% of TDS dissolved in 40% of ethanol was mixed with 9ml of sSPI (4% to 10%). As it was shown in Fig.1., sSPI from 8%, 9%, or 10% of soy protein was coagulated in adding TDS solution. Also sSPI prepared from 3%, 4%, or 5% of soy protein was not enough to make a complex with 4% of TDS and the precipitation of TDS was observed. Though TDS nanoparticles prepared with sSPI from 6% of soy protein was not precipitated for first two weeks, the nanoparticle solution also was precipitated after three weeks storage. And it was found that many bacteria could survive in this solution as Table 1. These bacteria seemed to be in sSPI and it was survived in the TDS nanoparticle solution though TDS has antibacterial activity.

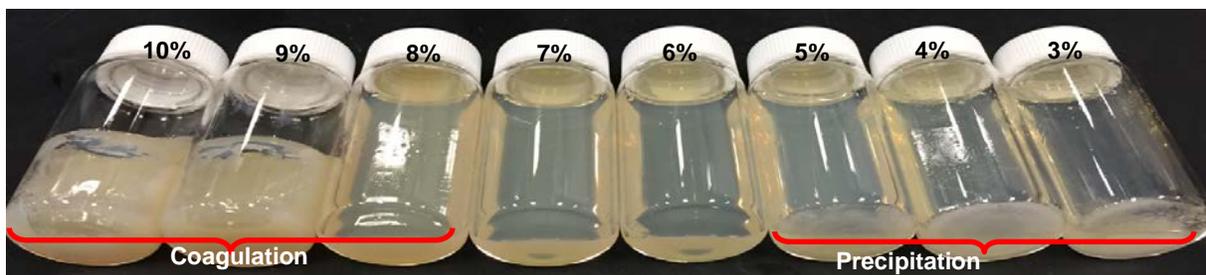


Fig. 1. Photo of nano-TDS prepared with different concentration of sSPI

We developed a new process to make the nano particle by directly adding TDS powder into the sSPI solution obtained from 7% soy protein. During adding TDS into the solution of sSPI, the solution was treated with 50% of ultrasonic power for 5min and the solution was pre-warmed and kept at 60C. We examined the stability of nano TDS during the storage at different temperatures. The particle size of TDS dissolved in ethanol was over 1000nm but nano-TDS was smaller than 25nm. The particle size of nano TDS was slowly increased at 4C and 25 C while rapidly increased at 35 C regardless of how to make. Size of TDS nanoparticle stored at 35 C for 3 months was similar to that of TDS itself.

Table1. Bacteria survived in nano-TDS

Media	sSPI	sSPI mixed with TDS dissolved in ethanol	sSPI mixed with TDS
Total Plate Count	5.8E+04	-	-

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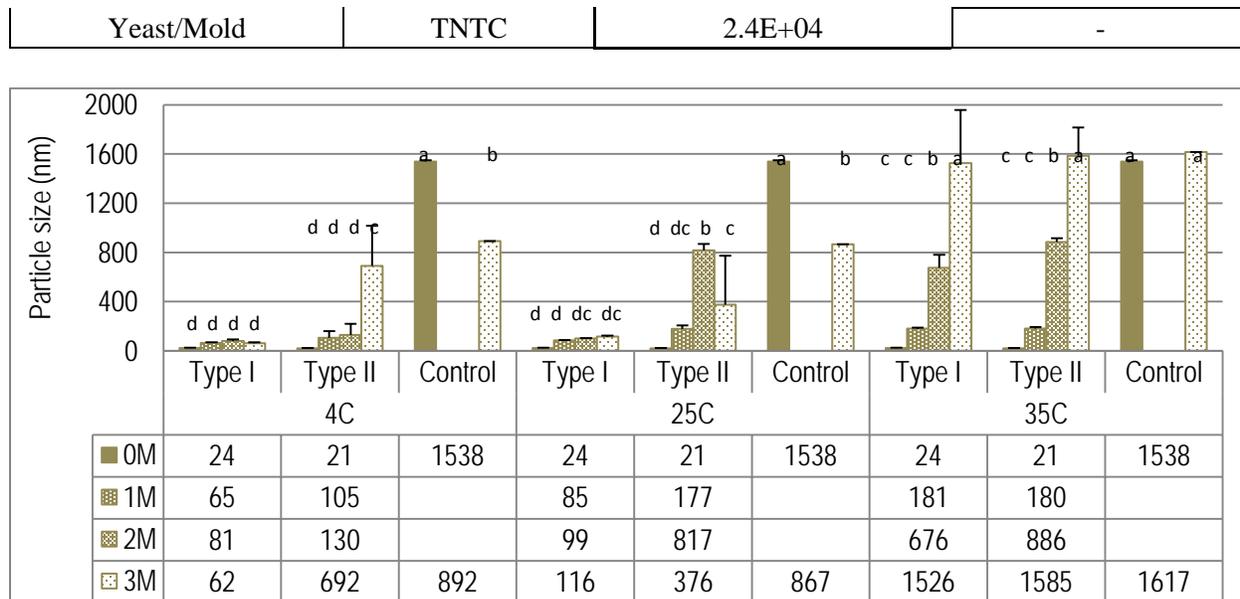


Fig. 2. Particle size of nano-TDS during the storage at different temperature
 Type I : nano particle made by directly adding TDS powder into sSPI, final concentration : 40,000 ppm
 Type II : nano particle made by TDS dissolve in ethanol into sSPI, final concentration : 40,000 ppm
 Control : TDS dissolved in ethanol, final concentration : 40,000 ppm

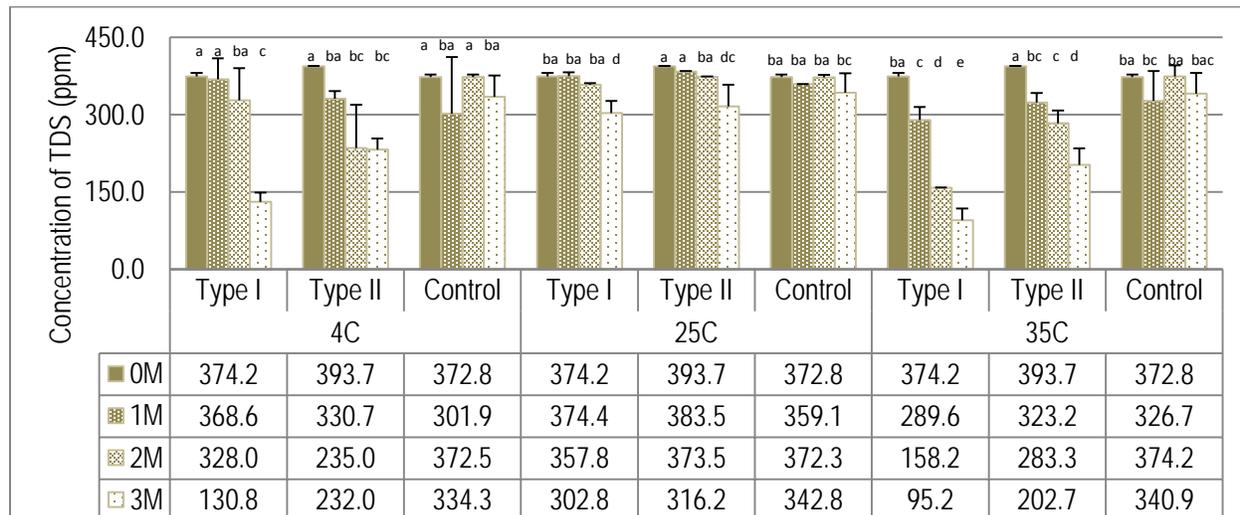


Fig. 3 . Concentration of nano-TDS during the storage at different temperature
 Type I : nano particle made by directly adding TDS powder into sSPI, final concentration : 40,000 ppm
 Type II : nano particle made by TDS dissolve in ethanol into sSPI, final concentration : 40,000 ppm
 Control : TDS dissolved in ethanol, final concentration : 40,000 ppm

The concentration of TDS which was dissolved in only pure ethanol without mixing with sSPI and stored at 4C, 25C, or 35C was reduced by 11%, 9%, or 10%, respectively. In case of nanoTDS, it was identified that the concentration of TDS was significantly reduced in both two types of nano TDS stored at 4C and 35C which was ranged from 59% to 65%, from 51% to 75%, respectively. Reduction of nanoTDS concentration stored at 25C

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was no more than 20%. It was observed the precipitation of TDS in the solution of nanoTDS stored at 4C and the coagulation of sSPI in the solution of nanoTDS stored at 35C. That seemed to be why it was shown the reduction of TDS concentration.

3. Evaluation on the inhibition effect of the TDS nanoparticle solution on the *Fusarium mycelia*.

The antifungal activity of the TDS nanoparticle solution against the *Fusarium sp.* and *Fusarium solani* mycelia was measured. Each sample was added when the PDA culture media was produced. *Fusarium* strains were cultivated at 25°C in a dark state for five days. A 0.5 cm colony of each *Fusarium* was inoculated at the center of PDA with or without TDS and the size of mycelia was observed for 12 days. The colony diameter was measured over time, and the mycelia growth inhibition rate was estimated using the following equation:

$$\text{Mycelia growth inhibition rate (\%)} = \frac{1 - \text{Diameter of mycelia in the TDS-treated medium}}{\text{Diameter of mycelia in the non-treated}} \times 100$$

Inhibition rate of the *Fusarium sp.* mycelia on the PDA plate added each fungicide was in the order of dazomet > nano-TDS > TDS. PDA added 400 ppm of dazomet, TDS nanoparticles, or TDS was able to inhibit 90%, 51%, or 41% of the *Fusarium sp.* growth, respectively. In case of dazomet or TDS, the inhibition rate of mycelia was no more increased as the concentration of each fungicide was increased over 600 ppm. However, the inhibition rate of TDS nanoparticles was rapidly increased until 6 days and was not big but continuously increased until 12 days incubation over 600ppm.

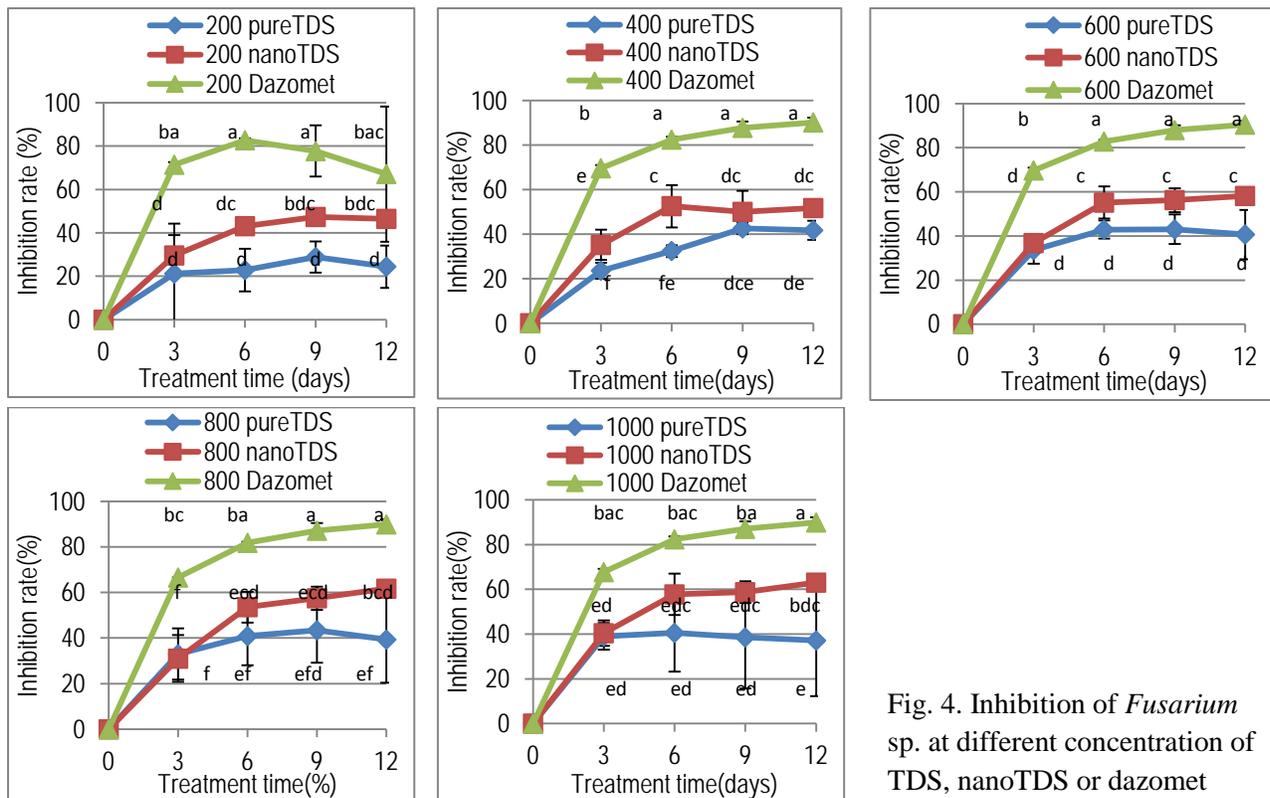


Fig. 4. Inhibition of *Fusarium sp.* at different concentration of TDS, nanoTDS or dazomet

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For the *Fusarium solani*, there were no significantly differences between the TDS and nano-TDS, but inhibition rate of fungus was about 85% on the PDA containing 200 ppm of dazomet. PDA added 400 ppm of dazomet, TDS nanoparticles, or TDS was able to inhibit 89%, 71%, or 68% of the *Fusarium solani* growth, respectively. When comparing the inhibition rate of two *Fusarium* strains, *Fusarium solani* was a little more sensitive to each fungicide than *Fusarium* sp.

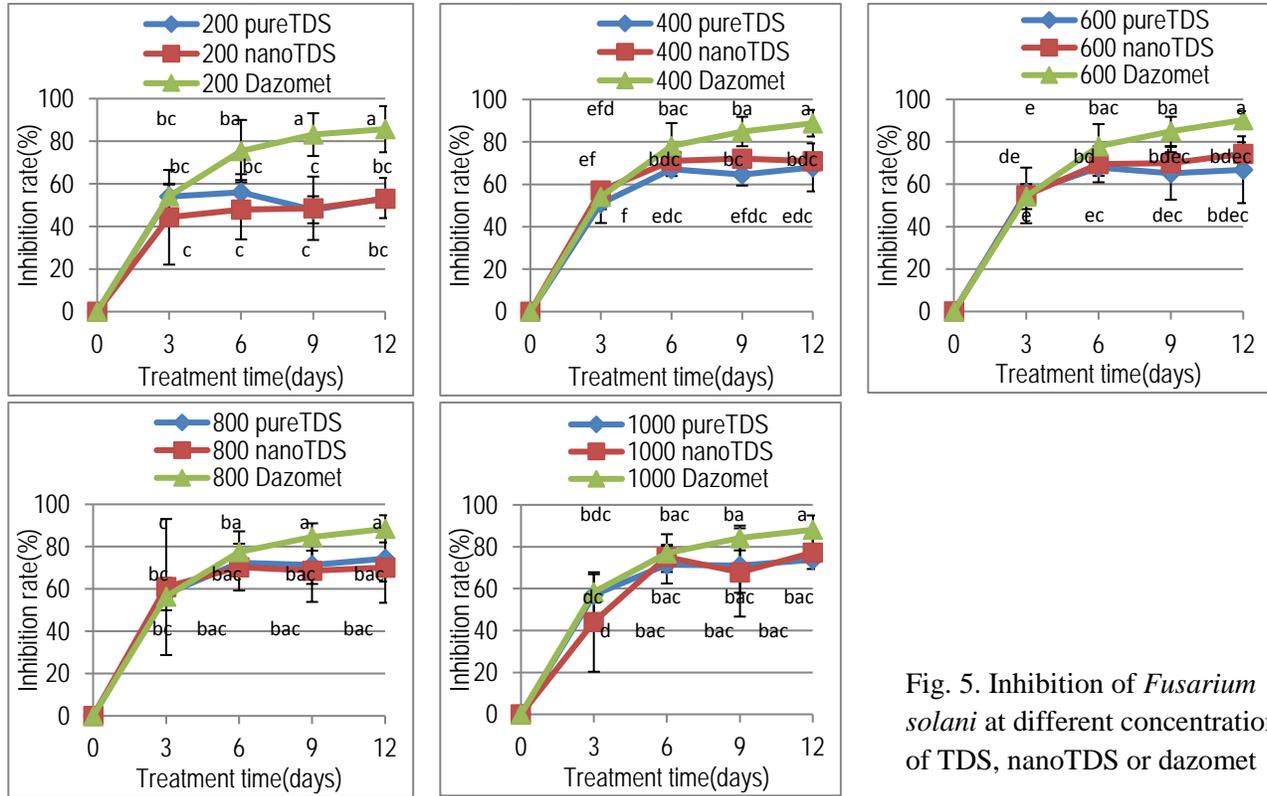


Fig. 5. Inhibition of *Fusarium solani* at different concentration of TDS, nanoTDS or dazomet

4. **Evaluation on the *Fusarium* spore germination after treatment with the TDS nanoparticle solution.** To examine the effect of the TDS nanoparticle solution on spore germination inhibition, a PDA medium was prepared with no TDS nanoparticle solution as a control group. For the experimental groups, TDS, TDS nanoparticle, or dazomet was added to a final concentration of 200, 400, 600, 800, and 1000 ppm in the PDA medium. For the control group and all the experimental groups, spores with a 1.0×10^3 conidia/mL concentration were inoculated and cultivated at 25°C in a dark state. To examine the spore growth inhibition rate, 1ml of spores with a 1.0×10^3 conidia/mL concentration was inoculated in the 1ml of malt extract broth added each chemical in 24 well plate, then cultivated at 25°C in a dark state for 24h. Ten microliter of incubated spore solution was place on hemocytometer to count the number of intact spore. Furthermore, to examine the spore germination rate, the following equation will be used with the spore concentrations measured by the hour:

$$\text{Spore germination rate (\%)} = \frac{\text{Spore concentration in the sample-treated medium}}{\text{Spore concentration in the non-treated medium}} \times 100$$

For the case of negative control (no treatment), spore were fully germinated to mycelia within 24hrs after the inoculation, while the spore germination rate decreased along with each agent's concentration.

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Spore germination inhibition of *Fusarium* sp. had the similar tendency to mycelia inhibition. Inhibition of spore germination was 97%, 75%, or 52%, in the presence of 600 ppm of dazomet, TDS nanoparticles, or TDS, respectively. As the concentration of TDS nanoparticles or TDS was increased, the germination rate was steadily decreased. However, only 200 ppm of dazomet was able to inhibit 85% of germination and the spore wasn't germinated until 48 h incubation. The nanoparticles could more effectively control the germination than TDS itself, possible due to large surface areas and small sizes, enough to penetrate into the cell membrane and work in the cytosols. The SEM showed severe spore damage including disruption and shrinkage.

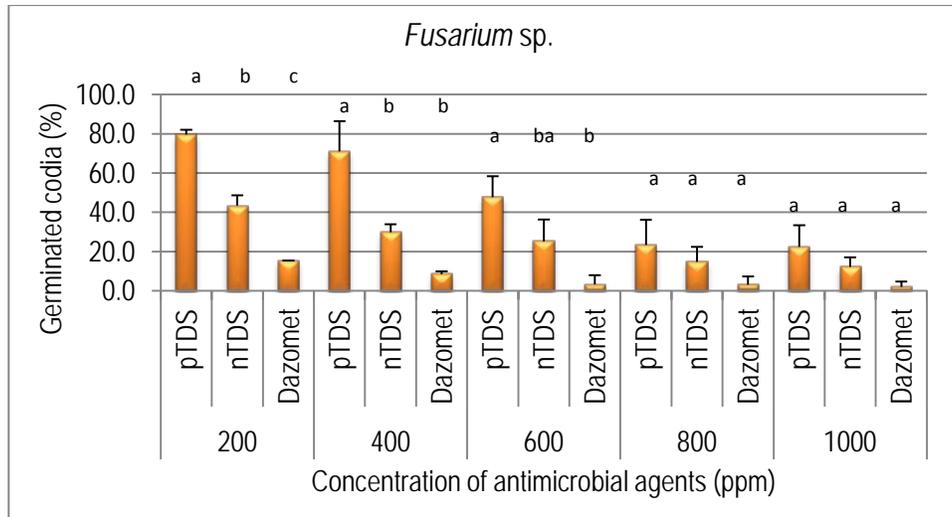


Fig. 6. Effect of TDS, TDS nanoparticles, and dazomet on *Fusarium* sp. spore germination after 24 h incubation

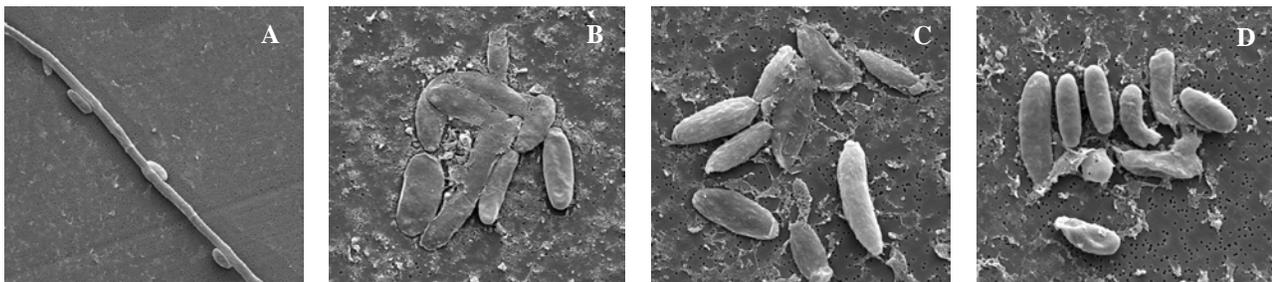


Fig. 7. SEM images of *Fusarium* sp. after the treatment of TDS, TDS nanoparticles, or dazomet (A) Negative control (no treatment) after 24 h incubation (B) 600 ppm of TDS (C) 600 ppm of TDS nanoparticles (D) 600 ppm of dazomet

Also the tendency of spore germination inhibition of *Fusarium solani* was similar to the mycelia growth inhibition. In case of dazomet, even 200 ppm was able to inhibit 98% of spore germination and over 400 ppm of dazomet completely inhibited the spore germination. There was no significantly difference between TDS and TDS nanoparticles. It was founded the inhibition rate of germination was 100% for TDS and 96% for TDS nanoparticles in the presence of 1000ppm. When observed SEM photos, the images were slightly different to that of *Fusarium* sp. First, the size of *Fusarium solani* spore was much longer than that of

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Fusarium sp. And the spore seemed to be damaged and burst as well as shrinkage after the treatment of each chemical for 24 h incubation

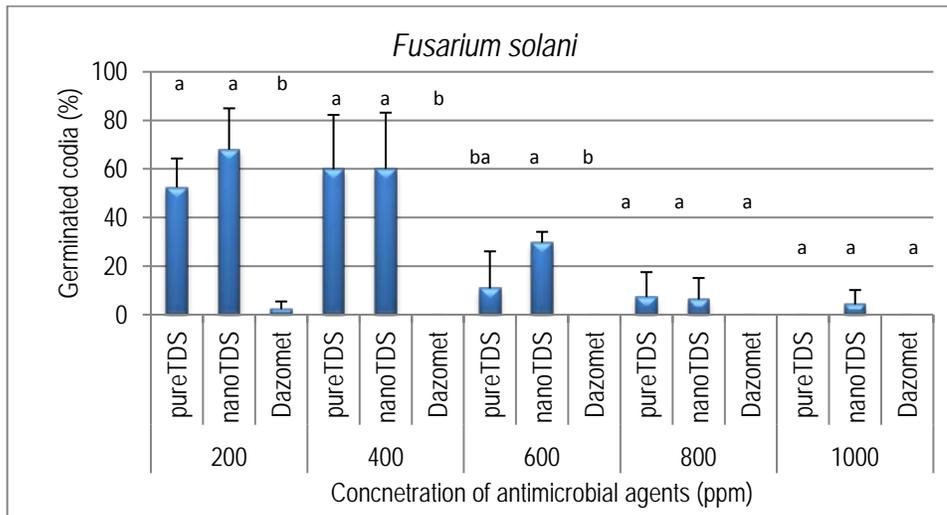


Fig. 8. Effect of TDS, TDS nanoparticles, and dazomet on *Fusarium solani* spore germination after 24 h incubation

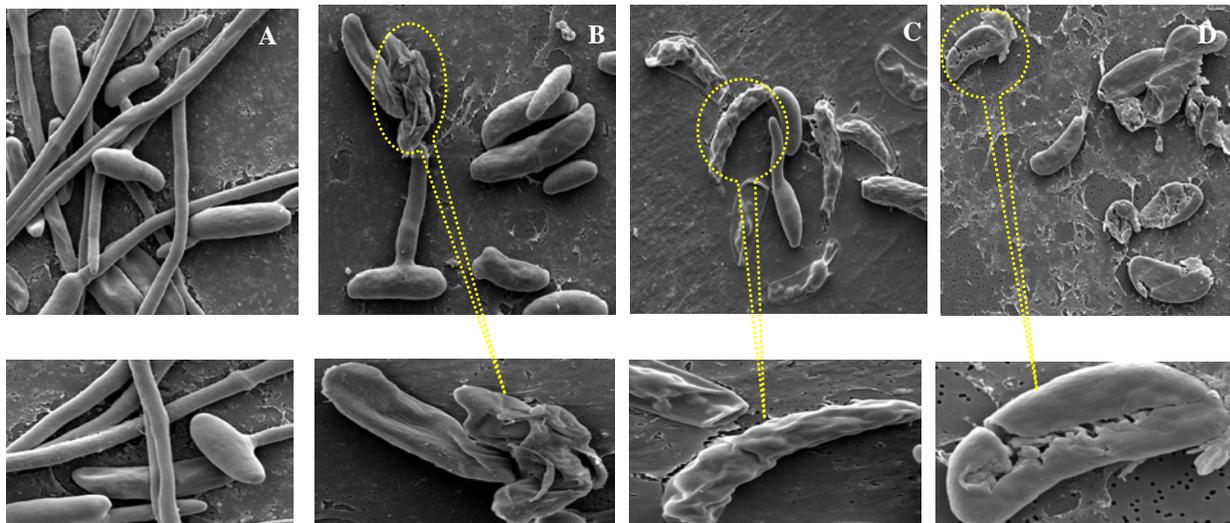


Fig.9. SEM images of *Fusarium solani* after the treatment of TDS, TDS nanoparticles, or dazomet (A) Negative control (no treatment) after 24 h incubation (B) 600 ppm of TDS (C) 600 ppm of TDS nanoparticles (D) 600 ppm of dazomet

5. Treat horseradish sets with fungicide and TDS/or TDS nanoparticles and culture them.

We cultured horseradish sets to check the effect of nano TDS on the growth of fungi. The roots for this experiment were obtained from horseradish association. Roots (1.5 cm to 2.5 cm in diameter, no discolored or not severe discolored roots) were selected, washed with tap water, and cut into 10 cm to 15 cm segments. Each 10 sets were placed in the bag that contained 1000 ppm of nano TDS or tap water as a control and shaken for 5min. Treated sets were drained and dried in an exhaust hood for 30 min. The sets were cultured at

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4C or 25 C for 3 month. The sets were surface-sterilized after 1month and cut into 0.5cm and placed on acidified PDA and incubated at 24C for 10 days. Cultured segments were examined for fungal (*Fusarium* – like fungi) growth. Effect of TDS would be checked by the number of set which fungal was growing on PDA. Of set cultured at 4C, fungi-growing of set treated with nano-TDS was slightly lower than that of untreated set. However, it was shown that there was not significantly difference between the treated and the untreated cultured at 25C.

Table 2. Sets of horseradish with fungal colonies following set treatment in TDS nanoparticle

Set culture	Temperature	Condition	4 weeks	8 weeks	12weeks
Set with fungal colonies (%)	4 C	untreated	10 ± 0.0 ^{ba}	10.0 ± 0.0 ^{ba}	15.0 ± 5.0 ^a
		treated	3.3 ± 4.7 ^a	5.0 ± 5.0 ^{ba}	12.7 ± 2.7 ^{ba}
	25 C	untreated	13.3 ± 4.7 ^a	10.0 ± 10.0 ^a	25.0 ± 5.0 ^a
		treated	10.0 ± 8.2 ^a	15.0 ± 5.0 ^a	20.0 ± 0.0 ^a

Goals and Outcomes Achieved (Expected Measurable Outcomes)

The overall goal of the proposed work was to control the internal discoloration of horseradish roots caused by *Fusarium* sp. The goal of this one-year project was to achieve effective inhibition the growth of the fungi isolated in this study and spore germination using TDS/TDS nanoparticle solution. The target was decreased by not less than 50% when treated with TDS compared to the non-treated samples.

For the mycelium growth inhibition by TDS nanoparticle, *Fusarium* sp. was inhibited by over 50% at 400 ppm after 6 day incubation and 67% at 1000ppm after 12 days incubation. *Fusarium solani* was inhibited by 53% at 200 ppm of TDS nanoparticle after 12 days incubation and 77% at 1000ppm after 12 days incubation.

For spore germination inhibition by TDS nanoparticle after 24 h incubation, *Fusarium* sp. was inhibited by 57% at 200ppm and 88% at 1000ppm. *Fusarium solani* was inhibited by 32% at 200ppm and 96% at 1000ppm.

Effect on horseradish sets discoloration of TDS nanoparticles was checked by the number of set which fungal growth was identified on PDA. The fungi-growth of the sets treated with nano-TDS was 23.5 % at 4C or 20% at 25C lower than that of the untreated set.

Beneficiaries(Potential impacts)

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

By reduction of discoloration and then the losses, this project will benefit the horseradish growers in Illinois and other states.

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

The 12 horseradish growers who produced 50% of the horseradish in the United States will the beneficiaries of this project. According to the President of the Horseradish Growers of Illinois, the economic impact of the losses due to discoloration will be in million dollars.

Lesson Learned

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- 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.

This project was done according to the plan except one item. We planned to visit horseradish growers but were not able to pay visit to individual farmers. However, we attended the annual meeting of Horseradish Growers of Illinois, and got a chance to talk with the growers face to face.

- Describe unexpected outcomes or results that were an effect of implementing this project.
NA
- If goals or outcome measures were not achieved, identify and share the lessons learned to help others expedite problem-solving.
NA
- Lessons learned should draw on positive experiences (i.e., good ideas that improve project efficiency or save money) and negative experiences (i.e., lessons learned about what did not go well and what needs to be changed).
NA

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.

NA

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Illinois Department of Agriculture Final Grant Progress Report

SC-15-19

NAME OF APPLICANT

Stacy Pasoni, Healthy Hippie Chef

PROJECT TITLE

Enhancing Market Opportunities for Illinois Specialty Crops with Consumer Education Targeting Healthy Living

PROJECT SUMMARY

The goal of this project was to enhance market opportunities for specialty crops through consumer education and demonstration. While marketing programs have a long history of focusing on informing consumers about the crops being grown and directing consumers to local growers, many consumers lack cooking/preparation skills necessary to increase consumption to a level where true health benefits of an improved diet are realized. As a result, overall market potential is limited and producers are falling short of maximizing per capita sales to existing customers. The project was conducted by Stacy Pasoni, "The Healthy Hippie Chef", as part of her regular appearances on a weekly TV program soon to be syndicated and currently airing on a Fox affiliate with a sizable and growing audience. Additional educational contacts were made through public appearances and existing social media outlets where followers access Pasoni's healthy living cooking advice and also through appearances on the TCT network worldwide. Consumer social media contact was also utilized to monitor progress and results. To provide the diverse consumer audience with more complete information about aspects of food production and innovative ideas to utilize fresh produce in a healthier diet, the project includes segments to highlight specialty crop research and innovation at the University of Illinois, Dixon Springs Agricultural Center as well as the Illinois Specialty Crop Agritourism & Organic Conference, various farmers markets through Illinois and various farms and orchards throughout Illinois. Information on existing websites, links, etc. was also provided to direct consumers to local growers. With this well rounded approach to increase consumer awareness and food preparation abilities, health conscious consumers can eat better as a result of increased purchases of local specialty crops.

PROJECT PURPOSE

Lack of consumer awareness concerning the availability of local produce and how to prepare it is a significant hurdle facing the growing segment of the public striving to achieve a healthier lifestyle. At the same time, this lack of consumer understanding is also a hurdle to producers seeking opportunities to improve markets for IL Specialty Crops. Even though many specialty crop marketing campaigns have been conducted through the years, the focus of the majority of these projects has been to direct consumers to marketing outlets of fresh raw produce, usually on-farm markets or farmers markets. While these programs have certainly not failed at communicating an important message, most consumers have limited knowledge of the variety of methods in which fruit and vegetables can be incorporated into their diet in anything but its fresh form. For example, a large and growing percentage of consumers would not think of eating a peach in any other form than as a fresh peach or peach jam. Teaching consumers how to use fruit and vegetables in innovative and creative ways, such as a peach salsa, a sauce for pork/chicken dishes or incorporating vegetable purees into soups and other dishes are opportunities for increasing consumption and sales opportunities for IL specialty crops.

Consumers are constantly bombarded with health and nutritional facts through various media sources concerning the benefits of eating more fruit and vegetables, so consumer awareness is ever increasing. At the same time, the average consumer tends to be less than knowledgeable about the food that is being grown all around them and how to make the most of available local foods in their diets. The flood of information and increased awareness triggered by overall health concerns and rising healthcare costs is something that the specialty crop industry as a whole should strive to capitalize on. Since consumer interest in adopting healthier eating habits is increasing, it is important that consumers are better informed about production and preparation factors that can make their pursuit of a healthier diet into a more enjoyable experience. It is a lack of information concerning basic cooking techniques and innovative preparation ideas that is the largest hurdle for many consumers to overcome. At the same time, consumer interest in overcoming this hurdle is on the rise. This project has helped to increase consumer awareness, through an established and expanding TV and social media audience (also keynote speaker engagements), about what produce is available, seasonality, how to locate local farms and farmers markets and provide further educational information concerning methods to increase specialty crop utilization in the diet of the average consumer. University of Illinois, Department of Crop Sciences Staff and facilities at the Dixon Springs Agricultural Center was also utilized as an important informational resource for this project.

PROJECT ACTIVITIES

- Keynote speaker (power point presentation/"Low Fat Consumers on High Information Diets") and filming at IL Specialty Crop, Agritourism and Organic Conf. Pasoni, Pinkston, Wyatt - January, 2015. Filming Jan. 7-9 conducting interviews and video footage of trade show, keynote speech, break-out sessions, cider contest, etc.
- Filming in studio cooking demonstrations to highlight IL Specialty Crop Products obtained at conference - Pasoni, Wyatt, Ingram, Pinkston (3+ extra film crew)
- (3) meetings with J. Pike, Dixon Springs Ag. Research Center to discuss/plan conference agenda and production schedule
- Filming TV segments at U of I Dixon Springs Ag Center - Pasoni, Wyatt, Pinkston, Gamble - production staff and crew. -
- Film TV segments/interviews at local farms/farmers markets - Pasoni, Wyatt, Pinkston, Gamble, Cooperating farmers, market mgrs. June, July.
- Fall production at various orchards throughout Illinois – Pasoni, Wyatt, Pinkston, Gamble.
- Keynote speaker for Professional Women's Network Linked In group pushing fresh and local and Illinois Specialty Crops encouraging women to take surveys, visit my website, follow me on all social media to find creative and easy ways to incorporate healthy locally grown produce into one's diet.
- In studio kitchen shoot highlighting products from Specialty Crop Conference and incorporating them into healthy recipes. (Lots of prep work creating new recipes to use in the shoot.) All studio shoots require set-up and tear down time not only for kitchen prep, but also for video production/lighting, etc.
- Keynote speaker at Rend Lake College Health Fair.
- Links to all websites and links to Facebook pages for Illinois Specialty Crops and IDOA making it easy for visitors of my webpage to link back to these agencies and to increase likes and followers.
- Production and editing for long form piece and production time for creation of logo and :30 spot for Illinois Fresh for advertising on the show and social media. (Links for all production provided below.)
- Production shoot in studio with Rendleman's Orchards (extra bonus segment aired June 27, 2015) and editing aired on The Spiel.
- Attending Fitness show gaining insight into how fresh fruits and vegetables plays a major role in overall health through interviews with contestants about diet and exercise and finding out their needs and wants regarding where, when, how to incorporate more fresh and local foods into their diet.
- Meeting with Dixon Springs planning upcoming production. Actual Dixon Springs shoot including interviews with John Pike and Jeff Kindhart along with production crew for second long form production.
- In studio shoot on April 30th in the Spiel kitchen with special guest, John Pike, from Dixon Springs Research Center highlighting produce from Dixon Springs and a whole meal cooked for TV segment showing how easy and delicious eating fresh and local can be (also highlighting various produce from Dixon Springs).
- Business Booster held at The Spiel studios and recipe demonstration (for TV production) featuring fresh and local produce.
- Final edit of Dixon Springs long form piece in July.
- Farmers Markets visits/interviews in preparation of upcoming shoot.
- Various pictures taken to promote farmers markets in the area and posted on social media sites.

- Farmers market shoot on July 11th.
- E-mails to promote Illinois Fruit and Vegetable Survey to encourage folks to buy fresh and local.
- Farmers Market visit July 15th to prepare for upcoming shoot in The Spiel Kitchen on July 16th with three separate recipes and various tips and tricks on how to acquire fresh and local fruits and vegetables, how to clean, prep and prepare for consumption (airing Sept. 7).
- Speaker at John A. Logan College on September 19th highlighting grant work, supporting your local farmers, buying and preparing fresh and local recipes and taking the survey for farmers markets.
- Illinois Fresh :30 commercial airing weekly on The Spiel produced by Jason Pinkston.
- Aerial shot with drone all over Illinois promoting orchards, farmers, etc. (Link to video below) BEAUTIFUL - A MUST WATCH!
- Fall orchard shoot Nov. 12 –Pasoni, Pinkston, Wyatt, Gamble
- Nov. 15th In Spiel Studio kitchen recipe shoot highlighting orchard goodies – apples, vegetables, pumpkins.
- October 18th pictures and visit to Flamm’s Orchards to incorporate into long form production.
- October 20th TCT outside fall shoot highlighting my pumpkin snack mix recipe baked inside pumpkin.
- Holiday shoot highlighting fresh and local vegetables on TCT Network shot on November 17th.
- Production finished for final grant segment on November 23, 2015 highlighting orchards and fall produce in Illinois.
- Weekly Social media posts (Facebook, Twitter, Linked In, YouTube, Google Plus). YouTube video uploads plus e-mailing long form segments to various agencies to share and promote Illinois Specialty Crops.
- Pasoni’s Social media monitored daily and updated as necessary.
- Many hours devoted to planning, prep and experimenting/creating new recipes with fresh and local produce.
- Website design work for Healthy Hippie Chef’s website promoting Illinois Specialty Crops throughout 2015 and encouraging consumers to take the “Buy Illinois” challenge and pledge to purchase more Illinois products.
- Created survey through Survey Monkey building a bridge between farmers and consumers.
- Production/scheduling meetings every Monday (2015) devoted to planning video show material (The Spiel) and production shoots (long form) for Illinois Specialty Crops promoting fresh and local produce.
- Numerous shoots on the TCT Network discussing Illinois Specialty Crops and encouraging folks to incorporate fresh and local produce into their recipes.

GOALS AND OUTCOMES ACHIEVED

The primary goal of this project was to increase consumer knowledge about the availability of IL specialty crops that lead to increased consumption, increased local sales benefiting IL specialty crop producers and a healthier lifestyle for the consumer which Pasoni has not only met her goal, but exceeded it in many ways and gone far beyond what was required. With a wide variety of crops grown under various production systems, consumers gained insight into where farmers gain information to make locally produced fruit and vegetables more widely available. The ability to highlight the valuable research conducted at the Dixon Springs Research Center also ensured a high degree of professionalism was incorporated into the segments and added efficiency to the filming process since diverse crop production is taking place at that location. There were added TV segments, extra production and even a :30 commercial which aired on Fox 23 every Saturday throughout the year promoting Illinois Fresh.

The social media following for the Illinois Specialty Growers page on Facebook started with around 230 likes and now they have a following of 445 due to Pasoni sharing posts on her page and inviting her followers to like the Specialty Growers page. That is almost doubling their audience in one year alone. Also, the IDOA Facebook page started at 1,338 and has increased to 1,665 which in part is also due to Pasoni going above and beyond the Specialty Growers page and also sharing and inviting others to follow IDOA. Pasoni’s own page grew by 35% as well during the year which provided more of the latest information on incorporating fresh and local produce into one’s family’s diet – where to get it, how to prep, clean and prepare it once you get it home.

At least 20% of Pasoni’s social media contacts increased seasonal visits to local farm markets or farmers markets. This information is hard to put a firm number on, but after Pasoni’s many visits to the farmers markets and talking with and interviewing the farmers and consumers, they all agreed it was a big year and there was a packed crowd at every market.

At least 20% of Pasoni’s social media contacts increased purchases at local farm markets or farmers markets. Due to the sharing of dates, locations, times, and pictures of produce, etc., on social media postings, the farmers saw more purchasing from consumers and more folks wanting to achieve a healthier lifestyle.

At least 20% of Pasoni's social media followers increased the weekly number of home menu items including specialty crops (fruit and vegetables). Pasoni found during her appearances in person and on TV and in speaking with folks on almost a daily basis through social media and the posts and comments from followers that they were incorporating her recipes into their daily life and purchasing more local fruit and vegetables during the year.

A survey was developed to help build a better bridge between farmers and consumers and finding out better ways to bring the two together.

https://www.surveymonkey.com/analyze/vAI5r2Tr_2BYzE_2FEvU400mJXmN0rPw2ARSiJ6nRpH16M_3D

Performance Monitoring was conducted primarily through social media. Comments and responses were monitored. Feedback was solicited throughout the duration of the project and survey instruments were developed for gaining knowledge to help the farmers better serve the consumers. Contacts and regular dialog with followers was greatly expanded. Social media outlets were checked and monitored on a daily basis to monitor comments and related input. Response to project related information was outstanding. The farm related information was an asset to the educational cooking segment of the TV and comments related to consumer/producer interactions were interesting and valuable to specialty crop producers as they enhance individual farm marketing strategy. It is hoped that the video segments would be of benefit to the specialty crop trade associations and individual producers as links to farm websites to provide cooking tips to their established customers. The segments were made available to the Illinois Specialty Crop Association and Pasoni would welcome the opportunity to participate in workshops and conferences in the future to share cooking tips, experiences and feedback associated with the project.

Pasoni utilized the social media network to increase consumer awareness concerning the availability of local produce and how to incorporate more of those products into a healthy, affordable and tasty diet and promoted existing websites, links, etc. established to assist consumers to locate locally grown IL specialty crops. to include sites such as: IL Department of Agriculture, IL Prairie Bounty, MarketMaker, IL Specialty Growers Association, IL Farmers Market Association and more and also incorporated these links in her TV segments as well as in commentary.

BENEFICIARIES

A wide variety of specialty crop producers benefited and can in the future still benefit from the efforts of this project by utilizing the TV segments already produced to highlight ways to incorporate fresh and local fruits and vegetables into their diet and also where to get them and what to do with them once they arrive in your home as well as tips and tricks for cleaning, prepping for longer shelf life.

Pasoni's TV and social media outlets allowed for significant penetration into consumer markets within 100 miles of Marion, IL. According to producer and market registrations/listings on IL MarketMaker, there are 176 specialty crop farms and 43 farmers markets in the region. Pasoni's primary TV outlet, "The Spiel", which airs on a Fox affiliate serving a coverage area with over 1 million viewers in southern Illinois and several surrounding states, is expected to go into syndication soon which could significantly expand the consumer viewer base. In addition, she is a regular guest on the TCT network based in Marion, IL which is currently airing on 3 channels, reaching 60 million homes world wide. While difficult to quantify exact producer benefit related to this outlet, TCT has viewers across Illinois and any information related to specialty crop consumption or directories for IL specialty crop producers would be applicable throughout the state.

Through various social media outlets, Pasoni is well equipped to direct informed, health conscious consumers to many IL specialty crop producers. Approximately 176 specialty crop operations and 43 farmers markets are identified in Pasoni's primary coverage area. Social media contact and personal appearances expanded that area and the number of affected beneficiaries to some extent.

The project benefitted and will continue to benefit the specialty crop beneficiaries through various TV and social media outlets including a YouTube channel for Illinois Specialty Growers which can be viewed globally online at any time wherein a large number of consumers have received and will continue to receive current and innovative information about local specialty crop availability and innovative tips on how to incorporate more fruit and vegetables into a healthy diet. The regular contact with an existing and growing consumer audience has helped and will continue to help not only to expand and reinforce the benefits associated with adopting a healthier diet, but also utilize professionally produced video segments from the University of Illinois research center at Dixon Springs to increase the consumer/customer's understanding of local food production and available resources to help locate specialty crop farms and local markets. As a result of these efforts, specialty crop producers could realize increased sales to existing customers as well as the gain of new customers equipped with the necessary information to incorporate more fruit and vegetables into their diets in a

meaningful way. It should be noted that while the educational information disseminated through this project has increased the general knowledge and ability of consumers to make more effective use of specialty crops in their diets, individual farms will still need to be involved in marketing efforts of their own to best position their farm within the market as a whole.

The overall potential of this project is huge, but it is difficult to estimate projected impact from each and every farm in Illinois, but given the identification of only 176 specialty crop operations and 43 farmers markets in the conservative primary region of impact, if each farm would realize \$100 of additional sales and each farmers market would increase seasonal sales by only \$500, the combined increase in sales would be \$39,100. As a result of this project, if just 10% of those contacts through social media were motivated to spend an additional \$20 on fresh fruit and vegetables, that level of sales would be reached. With several hundred thousand consumers receiving comparable information through TV, very modest increases in specialty crop purchases by a small percentage of those viewers would have resulted in substantially greater benefit to the IL specialty crop industry and still can with access to those TV segments and videos on the Specialty Growers YouTube channel. Regardless of what the actual economic benefit might be, a very slight change in the eating habits of a very low percentage of the project audience still allowed this project to be to be a very good investment of grant funding.

While viewership of “The Spiel” and TCT reach an audience in multiple states, this project was *not* submitted as a multi-state project, but upon successful completion of this project Pasoni feels this project could be well suited as a multi-state application (even national) in the future. Social Media reach is worldwide. Pasoni’s social media followers were also beneficiaries as well as Specialty Growers and IDOA followers in providing ideas and recipes for incorporating fresh and local fruits and vegetables into their daily diet. Pasoni’s TV segments, in person appearances, speaking engagements and social media posts also increased seasonal visits to local farm markets or farmers markets where IL Specialty Crops are the primary goods sold which benefitted the farmers by increasing purchases of IL Specialty Crops at local farm markets or farmers markets.

LESSONS LEARNED

Some of the frustrations during this grant were not being able to capitalize on marketing efforts to increase promotion of Specialty Crops due to money constraints. With more dollars readily available to advertise through mainstream media, Pasoni’s production team could produce some :30 infomercial spots that could educate and inform consumers on the latest recipes and most up to date information regarding fresh and local produce. The more folks see the products and how to incorporate them into their family’s diet, the more likely they are to purchase these fruits and vegetables. McDonalds has a drive-through a mile long. Every time I turn on the TV, there is a commercial featuring one of their products. Illinois Specialty Crops could benefit by using some of these beautifully produced spots to stay top of mind while consumers are shopping.

It is also hard to get folks to take surveys and take time out of their busy schedules to participate, so I found it much more beneficial to actually interview consumers and meet with them after speaking engagements or on my own time to actually find out what needs to be done to build a bridge between the farmers and the consumers.

Also, the production team worked very hard on shooting and editing these pieces, and they did them at a very low rate. Pasoni also worked daily on this project and underestimated the time it would take and the costs of produce she would incur from creating and mastering these recipes.

The farmers could benefit greatly if they would offer some of their produce for these recipes in the future and that could be a great stealth advertising for them as well as a savings for the chef as well which in turn could keep costs lower.

This being Pasoni’s first grant, she was very appreciative of the opportunity and all work was completed in a timely manner even with some money constraints. This is a true passion for Pasoni and she welcomes the opportunity to work with Specialty Growers in the future.

CONTACT PERSON

Report Submitted By: Stacy Pasoni

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Fax: n/a
Email: sjhippychick@yahoo.com
Date Submitted: 12/1/2015

ADDITIONAL INFORMATION:

The links provided are to the YouTube page for Specialty Growers Association which has the uploads for all long form videos, :30 Illinois Fresh Spot, etc.

<https://www.youtube.com/channel/UCE3Pnltw86A37SrKsCTI-rw>

The link below is a link to The Spiel on Fox 23 which also contains commercials and teases to promote Illinois Specialty Crops and IDOAI.

<http://www.spielon.com/#!past-episodes-/c1d4m>

SC-15-21**NAME OF RECIPIENT** D.K. Lee, Associate Professor

Jeremy Shafer, Coordinator, Horticulture Research and Education Centers

University of Illinois at Urbana-Champaign, Department of Crop Sciences, 1102 S.
Goodwin Ave. Urbana, IL 61801**PROJECT TITLE** Sustainable local mushroom production systems for Illinois to enhance grower profitability and increase consumer choices**PROJECT SUMMARY** This project was designed to look at evaluation, modification and development of lower input mushroom production systems that work well in Illinois' climate. The project was aimed at two areas of focus.

One area of focus was the production of mushrooms in Illinois during winter months using Illinois high tunnel resources. High tunnels in Illinois are commonly used for the production of lettuce, spinach and other leafy greens or left vacant during winter months. While the production of greens has proven to be profitable in some areas of Illinois, there are many areas in Illinois where marketing opportunities for greens are limited. Mushrooms offer an alternative to greens which may have wider access to markets. Preliminary research at the University of Illinois Dixon Springs Ag Center (DSAC) had found that by adding a small electric heating cable to beds, mushrooms could be picked in otherwise unheated high tunnels all winter long, even with temperatures at or slightly below 0 F.

A second area of focus will look at producing mushroom using all or nearly all local, native materials for substrate. Preliminary work at DSAC had shown that elm oyster mushrooms could be produced using only locally sourced sawdust generated from the harvest and production of local native trees. DSAC had also examined oyster mushroom production using wheat straw from locally grown wheat in conjunction with cotton seed hulls, which has given very good results. This proposed work also evaluated the use of straw from native prairie grasses such as big bluestem and switchgrass to determine the feasibility of these materials for mushroom production.

Demand for locally produced food is at an all-time high in Illinois. Consumers seek locally grown produce for many different reasons. These may include one or more: higher nutritional value, better appearance, better flavor, wider selection of varieties, less food miles, greater economic impact associated with local food purchases and more. Highly perishable commodities like strawberries, peaches and tomatoes are

commonly sought from local producers from roadside stands, farmer's markets, and contractual arrangements such as restaurants with local growers. Mushrooms are particularly well suited for local marketing because they have nearly all the characteristics listed above. While white button and portabella mushrooms tend to be available in Illinois they are most often not from local sources. This project aims at increasing the availability of white button and portabella from local sources and also investigates the development of sustainable systems to produce oyster mushrooms.

- Illinois' local food economy continues to grow rapidly. The majority of this expansion is by producers that are direct marketing to consumers or wholesaling to higher end customers such as restaurants. The availability of local mushrooms is low, especially for specialty mushrooms like oyster mushrooms, and the demand is in extreme excess of current and projected future production in Illinois

PROJECT APPROACH

- **Specific objectives of this project were:**

- 1) Compare productivity of oyster mushrooms on various substrates including those containing straw from native prairie grasses,
- 2) Evaluate the feasibility of white button and portabella mushroom production during the winter in high tunnels in southern Illinois, and
- 3) Increase specialty crop growers' knowledge about management practices and economic feasibility of mushroom production in Illinois.

- **Work plan**

Native grass straws were harvested for straw in January 2015. Oyster mushroom production (12 strains) initiated in early 2015 and is continuing for a 24- month period. Each strain was grown on several substrates, containing either wheat straw, switchgrass straw, big bluestem straw, or corn cob. The incubation and fruiting times were recorded as well as harvested fresh market weight. There was a minimum of 4 cycles, one in each winter, spring, summer and fall season. The starting time of each cycle varied depending on climate conditions such as temperature, especially for the winter and summer cycles.

Evaluation of the feasibility of white button and portabella mushrooms was conducted in the fall of 2015. Beds in high tunnels located at DSAC were prepared with mushroom media and inoculated with either portabella or white button mushroom spawn. The beds were equipped with heating cables and covered with a thermal nursery blanket. They fruited during the winter and spring of 2016. The beds were steam pasteurized and utilized for tomato production in spring and summer of 2016.

All experiments were conducted using randomized complete block design with a minimum of three replications. The resulting data were statistically analyzed and presented at a workshop at the 2016 and 2017 Illinois Specialty Crops Conference. The project was showcased at field day events in both 2015, 2016, and 2017.

From the beginning of 2015 to 2017, we completed 6 trials of oyster mushroom production research with the combination of strains and substrates. The oyster strains we tested were Phoenix, Black, Cool Blue, Lemon, Blue, Elm, Brown, PoHu, Italian, Gray Dove, and Golden, and the substrates we tested were wheat straw, switchgrass straw, big bluestem straw, and corn cob. All substrates were mixed with cotton seed hull. We tested various containers including poly bags containing ½ and 1.0 lbs substrates, five-gallon size black poly bags, and ½ gallon glass jars.

We also tested the feasibility of white button and portabella mushroom production

combined with tomato production. During the winter of 2015, white button and portabella mushrooms were grown on compost beds in high tunnels, and after completion of mushroom production, the compost beds were used for tomato production in the spring of 2016.

The total incubation period, spawn run, and pinning lasted 3-4 weeks depending on the strain and growing conditions. Once the mushrooms reached the pinning stage, 90% of the rest of the production cycle was completed within the first 30 days (Figure 1A). However, depending on species and temperature condition, the production periods were delayed up to 60 days. The Elm, Gray Dove, and Italian strains performed better than other strains during the cold period in the late fall through early spring, and the Golden and PoHu strains performed better during the warm period in the late spring through early fall. Depending on the strain, mushroom productivity on various substrates was different. The substrate mixed with big bluestem produced the lowest amount of mushrooms, but there was no statistical difference among wheat straw, switchgrass, and corn cob, even though the substrate mixed with wheat straw produced the most mushrooms (Figure 1B).

Our results indicated that any kind of organic matter, including native grass straws and corn cob, could be used as substrates for oyster mushroom production. However, fresh mushroom productivity could be different depending on mushroom strains, as well as temperature and humidity conditions and control capability. It is strongly recommended that growers should test strains and available substrates at a small scale before expanding to large-scale production. One-pound poly bags were the best for mushroom production and handling. Although fresh market mushroom productivities were different depending on strains, substrates, and growing conditions, in general, we were able to produce over one pound of mushrooms using a one-pound poly bag culture system with a two-month turnaround time.

The feasibility test demonstrated that white button and portabella mushrooms can be successively grown on beds in high tunnels during the winter months and tomatoes can be subsequently planted on the bed after mushroom production.

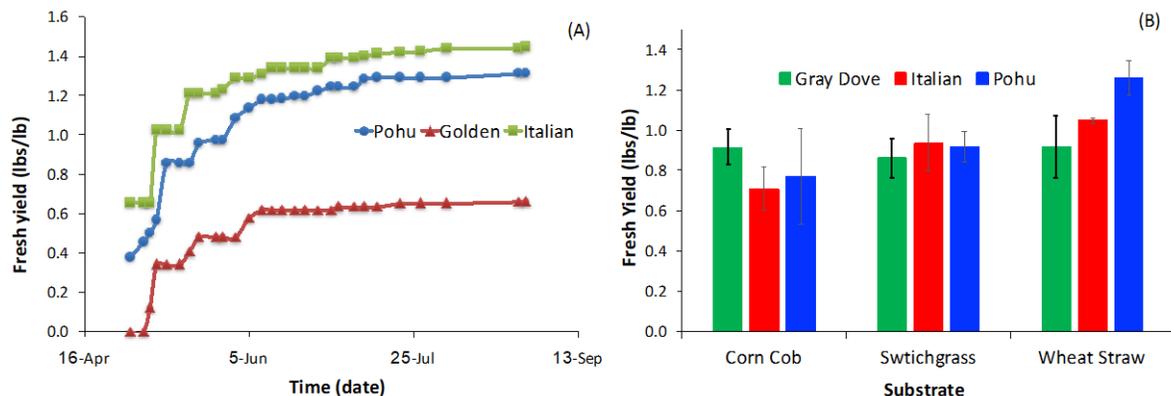


Figure 1. (A) Duration of PoHu, Golden, and Italian oyster mushroom production on wheat straw substrate, and (B) effects of substrates on Gray Dove, Italian, and PoHu oyster mushroom production.

- During the project period, the PI presented the research findings at the 2016 and 2017 Illinois Specialty Crops, Agritourism, and Organic Conference. The session had over 50 attendances at each conference. During the entire grant period, we had multiple small group visits to the mushroom production research facility and hosted two field days for

large groups in 2017. The first field day was a part of the 2017 Department of Crop Sciences Agronomy Day and there were over 40 people presents. The second field day was a joint event with the Student Sustainability Farm Open House and presented were over 80 peoples.

During the winter of 2016, we hosted a workshop and presented the results of the research and trained specialty crop producers and growers.



- We published the “Oyster Mushroom Cultivation” guide (attached) and distributed during the field days and made it electronically available.
- The University of Illinois provided greenhouse spaces and all necessary equipment including an autoclave and cold room spaces for high tunnel mushroom production.

GOALS AND OUTCOMES ACHIEVED

- The overall purpose of this project was to develop and deliver research-based information that allows for sustainable, efficient, profitable oyster mushroom production. Additionally, production of white button and portabella mushrooms was investigated with the goal of development of a profitable and sustainable system that can be a winter crop option for Illinois high tunnel growers. The white button and portabella system was studied in context of the mushroom being a winter high tunnel crop that is part of a systems approach that was followed with tomatoes which are Illinois’ growers’ most common high tunnel crop. This project provides Illinois’ specialty crop producers with an option to diversify their existing operations with a profitable and readily marketable crop that can be raised in a sustainable manner.
- Our research goal was to determine the best oyster mushroom strain and best native grass species to result in consistent, profitable and sustainable oyster mushroom production in Illinois. Many commercially available strains of oyster mushroom were evaluated for year-round production. These were grown in studies that also determined the interaction with growing media containing wheat straw, straw of the native grass species, big bluestem and switchgrass, and corn cob. Additionally, white button and portabella mushrooms were evaluated as a winter crop in high tunnels at DSAC. After the beds had been fruited and mushrooms harvested, the beds were steamed in the spring and the resulting spent mushroom compost was utilized and evaluated for tomato production. This two crop systems approach could greatly enhance Illinois high tunnel producer profitability.
- We successively demonstrated that small scale mushroom production, using small poly bags during the winter months, can generate additional revenues for specialty crop growers and local food producers who can access small spaces in high tunnels or any spaces that can kept above freezing temperature.

BENEFICIARIES

- The primary beneficiaries of the project were specialty crop growers and small scale local food producers. We developed mushroom production systems that use either high tunnels or may use insulated storage spaces such as the walk-in coolers frequently found on specialty crop producing farms. The extremely high value (commonly \$10 a pound for many species) and the small space required for production make this project suitable for those direct marketing specialty crops in both rural and metropolitan areas.

There have been several hundred high tunnels constructed in Illinois since 2009. All of the producers with high tunnels could be potentially impacted by this research. Mushrooms do not require (although they may utilize) a high tunnel environment, so a producer that has access to an area that can be kept above freezing such as a root cellar or insulated cold storage facility could also benefit from this research. The high value and small space requirement make mushroom production a possible fit for both rural and urban producers.

Specialty crop growers received information about the economics and results of cultural practice research for 3 mushroom species (white button, portabella, and oyster). In addition, interested growers attended a growing workshop in 2016, the specialty crop conferences in 2016 and 2017, and two field days in 2017 that presented the results of the research contained in this proposal. Through individuals visiting the research facility, workshops, conferences, and field days, we trained over 400 specialty crop growers and local food producers. The long-term outcome of this research will be a dramatic increase in the number of producers of specialty mushrooms in Illinois. This will benefit both Illinois producers and consumers.

Our research indicated that one pound of substrate utilized in a bag culture system and inoculated with various oyster mushroom spawn can yield in excess of one pound of fresh oyster mushrooms. Oyster mushrooms can be retailed from \$5.00 to over \$10.00 per pound and have willing consumers in the farmer's market, roadside stand and direct to restaurant marketing venues. The cost of the bag, mushroom spawn, media, and pasteurization is less than \$1.00 per bag with gross sales in the \$5 to \$10 per bag. The potential for profit could be quite significant for growers that are adaptable.

LESSONS LEARNED

- We found that researchers can also learn from growers and workshop participants. In the beginning of this project, we did not plan to use corn cob as a growing media, but as we learned from a workshop participant, we could have great success with mushroom production using corn cob. Corn cob is very common and easy to obtain in Illinois and could be an excellent media for mushroom production.
- We also found that there many hobby producers who are producing mushrooms in many different ways using different growing medias and containers. We had the best results with wheat straw and one-pound poly bags in high tunnel conditions. However, mushrooms, specifically oyster mushrooms, could be grown in many different environments, including basement and garages, with various growing media including coffee ground and papers, and using various containers including plastic food containers and jars. It was obvious that mushroom production can recycle various organic waste materials as growing media and used food containers and save our environment.

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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.

OYSTER MUSHROOM CULTIVATION

The market for specialty mushrooms in 2015-2016 increased, up 30% from 2014-2015 in the U.S. Among specialty mushrooms, Oyster Mushrooms have a high market value, don't require composting, and can be cultivated year-round.

STRAIN SELECTION

There are several commercially grown strains of Oyster Mushrooms including the strains picture below (left to right) Golden, Gray Dove, Elm, and PoHu. Optimum fruiting temperature are different depending on the strain. Strain selection should include consideration of the local climate or temperature of the growing space. Growing multiple strains allows for a longer production window throughout changing seasons. Oyster Mushroom strains grow on sterilized cereal grain and result in a mixture called spawn. Spawn is then used to seed a substrate.



SUBSTRATE

Many substrate options are available for growing mushrooms including chopped wheat straw, grass straw such as bluestem and switchgrass, crushed corn cob, cottonseed hull, coffee grounds, and mixtures of individual substrates. Soak the substrate in water for 24 hours. Adding 1% lime can sterilize the substrate, but pasteurization is preferred. To pasteurize the substrate, inject steam at 160°F for one hour.

INOCULATION

After preparing the substrate, inoculate it with the Oyster Mushroom spawn in a growth container. Potential growth containers include polyethylene bags, plastic containers with pre-drilled holes, and bottles. Drain excess water from the substrate, place the substrate in a container, and add the spawn to the substrate at 3-5% of the dry weight of substrate used. To increase mushroom production, add 2% rice bran to the substrate spawn mix. Next, close or seal the containers to keep in moisture and place in a dark room or covered for 7-14 days of spawn run. After completion of spawn run, the containers should be moved to a growth room. The total incubation period, spawn run, and pinning should last 3-4 weeks depending on the strain and growing conditions. During incubation, maintain the temperature around 70-75°F.





GROWING CONDITIONS & HARVEST

Temperature and humidity control are vital to proper development of Oyster Mushrooms. Optimum fruiting temperatures vary depending on the strain: Golden 60-85°F, Gray Dove 45-65°F, Elm 55-70°F, PoHu 55-85°F. During the fruiting period, relative humidity should be maintained at 85%. A poly tunnel in the spring and fall or a heated greenhouse during winter months work best for maintaining growing conditions. A commercial humidifier and mist nozzle water system also help maintain temperature and humidity levels.

Harvest mushrooms before the caps curl upward by firmly twisting at the base.

COMMON PROBLEMS

Pests

Bacterial and fungal contaminants may cause disease and affect mushroom production. The best prevention methods include maintaining proper temperature and humidity levels, allowing air movement throughout the growing facility, and performing appropriate substrate sterilization procedures. Growing mushrooms in small bags or bottles allows prevention of widespread contamination. A small bag or bottle can be removed from production without significant losses.

Deformation

Insufficient ventilation, chemical exposure, and inappropriate temperatures can cause deformed mushrooms. Maintaining airflow and temperature levels will help prevent deformation.

Spore Exposure

Oyster Mushrooms produce millions of spores throughout the day. Growers should wear masks and ventilate the growing facility to avoid adverse exposure-related reactions.

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

Project SC-15-24

FINAL REPORT 2016

PROJECT SUMMARY

Successfully reaching Illinois consumers to grow an awareness of the specialty crop industry and increase consumption of specialty crops 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 develop and print a new *Apples Ag Mag* and support trainings and county program implementation to ensure that new resources are actively utilized throughout the state. Apple lessons and activities not only increased awareness of specialty crops that are grown in Illinois, but also introduce more students and consumers to the ideas of locally grown foods, and the farmers that grow them, leading more consumers to engage in buying locally grown specialty crops.

The *Apples Ag Mag* continues to be one of the most popular lessons, and is a teacher favorite theme to incorporate into lessons throughout the year—even when they're not thinking directly about agriculture. Apples is one of the most requested *Ag Mags* and serves as an important “entry topic” to agriculture. Through the specialty crops grant, IAITC 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 and apple varieties that can be found at farmers' markets.

The *Apples Ag Mag* and subsequent classroom lessons and activities feature Illinois specialty growers and highlight the many ways Illinois apples are being used.

The *Apples Ag Mag* was developed by IAITC Education Specialists and reviewed by various agriculture, specialty, and topical experts from Illinois. The newest iteration of the *Apples Ag Mag* also incorporates Common Core Standards for grades K – 12, including focus on STEM and Next Generation Science Standards, making them a sound education resource for any classroom activity.

Grant dollars make the *Apples 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 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 these grants is critical in order to maintain this delivery model.

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

PROJECT APPROACH

The *Apples Ag Mag* was developed to showcase apple growers across the state of Illinois and follow the path of apples from seed to fruit. Lessons also focus on the nutritional benefits of the fruit. 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.

Discussing different varieties of apples is also an expanded to feature which includes the new Evercrisp apple. This Illinois-developed apple was released in 2012, thanks to the work of the Midwest Apple Improvement Association, and funding from the Specialty Crops Grant Program. This section engages students in the science, business, growing and marketing plans behind what looks like a “simple apple”.

The first step to prepare for development of the new *Apples Ag Mag* entailed conducting research and holding interviews. IAITC state education staff conducted research and identified subject matter experts. IAITC state education staff also conducted and video tape interviews for use in both the print and SMART Board lessons. The *Apples 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 *Apples 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 *Apples Ag Mag* was then designed by Illinois Farm Bureau Promotion and Graphic Arts Departments and are printed on recycled paper, with soy ink.

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

this website shows peaks in traffic times are early morning and mid afternoon, when most teachers have their planning hours.

The IAIRC structure has an established built-in delivery mechanism which will be used to distribute the new materials on specialty crops, ensuring strong outreach and information dissemination. There will be no direct shipping costs related to Ag Mag delivery.

The IAIRC 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 the Spring of 2015, 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 2015. 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 the Fall of 2015 County Coalition Grants were distributed to 69 Ag Literacy coalitions in the amount of \$532,000. This support for IAIRC 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 2016 to measure outcome related to new apple and specialty crops materials.

GOALS AND OUTCOMES ACHIEVED

Learning objectives for the *Apples 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.
-

IAIRC set the following goals with expected measurable outcomes:

- Increase consumer awareness of specialty crops by distributing 50,000 *Apples Ag Mags* annually.

Since receipt of grant, more than 52,000 Apples Ag Mags have been distributed.

- Increase nutrition knowledge related to apples as specialty crops 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 2016, 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 apples 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 apples.

2014-2015 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 Apples
- 1,403 Teachers reached with lessons related to Apples
- 26,183 Students reached with lessons about Specialty Crops
- 1,503 Teachers reached with lessons about Specialty Crops
- 12,000 Apples Ag Mags distributed

2015-2016 IAITC IMPACT DATA

- 646,201 Students reached with IAITC lessons
- 37,563 Teachers use IAITC materials during the school year
- 490 Teachers participated in Summer Ag Institutes, and 1,263 pre-service teachers received training through presentations on incorporating ag into the classroom.
- Book grants totaling \$21,492 provided new ag-related chapter books to teachers and libraries across the state.
- \$607,000 in grants were awarded to 74 local ag literacy programs, serving 84 Illinois counties, allowing them to grow and strengthen local grassroots efforts.
- Over 5,057 volunteers annually engage with students and teachers.
- Illinois counties invested nearly 2.2 million dollars in ag literacy.
- 34,642 Students reached with lessons related to Apples
- 2,319 Teachers reached with lessons related to Apples
- 55,111 Students reached with lessons about Specialty Crops
- 3,655 Teachers reached with lessons about Specialty Crops
- 52,000 Apples Ag Mags distributed

BENEFICIARIES

Raising awareness of Apples 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, 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 crops. By focusing on the variety of apples, uses and nutrition through fun and interactive lessons that also highlight where apples can be purchased, students are more excited and enthused about attending farmers' markets and selecting their own fresh produce. This same logic applies to the educators that are helping deliver the programs. Through IAITC Apples and Specialty Crop lessons, educators are encouraged to do taste testing with students and encourage educational field trips to farmers' markets as a follow up test and reward at lesson completion.

When specialty crops lessons are utilized in IAITC, it results in more than 650,000 students, their parents and siblings, 37,000 teachers and their families and an additional 200,000 consumers 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.

\$9,520 was expended to cover the printing of the Apples Ag Mag

\$2,500 was expended to support ag literacy coordinator and teacher trainings directly related to apples and specialty crops.

\$2,980 in grant funds supported county coalition grants, which totaled \$532,000 to 69 local ag literacy programs. This .5% of grant funding specifically supported lessons and outreach related to specialty crops. Each coalition received \$44 to cover salaries and expenses related to teaching and distributing information related to specialty crops.

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 in recent years 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 significant 20% increase in students involved from prior year.

IAITC program numbers will continue to grow as more educational resources are made available for teachers to integrate into the classroom. There is also additional focus placed on utilizing these education materials in more consumer outreach capacities, this year resulting in more than 200,000 additional consumers reached.

CONTACTS

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ADDITIONAL INFORMATION

Interactive SMART version of the Ag Mag is found here:

http://www.agintheclassroom.org/TeacherResources/AgMags/Apple%20Ag%20Mag%20_SmartBoard_3.pdf

Additional apple related activities can be found here:

http://www.agintheclassroom.org/TeacherResources/interest_approaches.shtml



Illinois Department of Agriculture Final Grant Progress Report

SC-15-25

NAME OF RECIPIENT

Illinois Stewardship Alliance

PROJECT TITLE

Increasing Supply and Demand of Specialty Crops in Illinois

PROJECT SUMMARY

Our overall goal was to further develop specialty crop markets and increase specialty crop purchases through consumer outreach and education, working with central Illinois specialty crop producers, and marketing to restaurants. Illinois has an abundance of prime farmland, yet the state imports most of its food. At the same time, demand for locally produced food continues to climb. 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. A 2012 survey of over 50 farmers in Illinois indicated that only 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. The intent of the project was to make it easier for farmers to reach chefs while also educating consumers.

Our objectives included:

- Encouraging chefs to purchase local, specialty crops by organizing 20 in-person chef meetings;
- Educating 5,000 consumers about the availability of local, specialty crops through e-newsletters, developing content about specialty crops for the new BFBL Central Illinois website, 5 cooking classes, and tabling with interactive educational tools at health fairs, women's groups, farmers market and family events;
- Organizing a farmer meeting to gather input on piloting a cooperative weekly email price list and online ordering system of specialty crops from growers in the Springfield area (or perhaps Champaign-Urbana)

This project built on previously funded Specialty Crop Block Grant Project to ISA from 2013 and 2014. Results from the project so far have included four successful Chef-Farmer Networking Events with almost 200 participants and the farm to table series, Local Flavors, planning is well underway with marketing materials developed and restaurants signed up to host events throughout the growing season. As a part of the 2014 Specialty Crop grant we received, we researched online marketing, inventory and ordering options to inform a pilot program once funding is raised.

PROJECT APPROACH

We set up one-on-one meetings with 22 chefs/restaurants owners in central Illinois to discuss the opportunity of buying local. Chefs ranged in experience and knowledge about local sourcing with most of having limited knowledge. These meetings laid groundwork for future outreach and education to make connections with local specialty crop growers. We sent out 4 emails to our list of over 50 chefs providing them with a seasonality chart, highlighting seasonal produce, and listing local specialty crop producers in the region who could supply this produce. These emails kept seasonal specialty crops in the forefront of chefs minds with reminders when new seasonal crops were available.

We tabled at 24 farmers markets or wellness fairs throughout central Illinois May – October to sample various specialty crops and encourage consumers to try new foods and learn how to prepare various specialty crops. At 15 of these events we offered samples of a specialty crop to introduce people to new foods and/or recipes. In some instances we offered different varieties (for example, apples) to showcase the diversity of varieties available in the region. Some examples of the specialty crop tastings were pickled beets, kohlrabi, kale salad, and zucchini salad. We received very positive feedback when sampling specialty crop products and people were eager to try to make recipes that were provided when a sample was also provided. It seemed to much more effective than just passing out a sample. Due to health department regulations, which vary from county to county, it's not always easy to sample at events but it seemed worth the effort. In one instance when we sampled kohlrabi at a farmers market, one of the farmer vendors shared that they sold a lot of kohlrabi that day.

We organized and supported five cooking classes; three of them were during National Farmers Market Week that were all focused on specialty crop/vegetables. There were two Farmers Market cooking classes held on August 3rd. One with genH kids at Hy-Vee which demonstrated the local produce available in the grocery store with 5 people attending. Another cooking class was held at the Sangamon County Department of Public Health with St. John's Hospital to reach low-income families with 20 people attending. We held a "Garden to Plate" cooking class at Chatham Public Library where participants made a shredded vegetable salad and Israeli couscous with seasonal vegetables which was taught by Chef Denise Perry with 40 people attending. In October, a Kids in the Kitchen cooking class was held with about 25 attendees and Fermentation Fun class was held on an urban farm in Springfield with 20 attendees.

In lieu of organizing an on-farm tasting tour, we organized a restaurant tasting tour that featured three specialty crop producers in the Springfield area. On August 8, 60 people attended a tasting tour that visited four restaurants that prepared dishes highlighting local, seasonal produce. One restaurant had never sourced locally and the other three were seasoned chefs. At three of the four locations, dinner attendees heard from specialty crop farmers about their farming operations and highlightings the unique crops that they grow. This event was incredibly popular and seating filled up very minimal promotion.

We wrote 12 specialty crop farmer profiles that were published on the Buy Fresh Buy Local Central Illinois website and newsletter including the following:

- Chad Wallace of Oak Tree Farms (who grows a wide-range of specialty crops with a CSA)
- Brian Severson Farms (specializes in sweet corn)
- Jacque Suttill Simpson of Suttill's Farm (diverse vegetable operation with on-farm stand)
- Clay Yapp and Traci Barkley of Sola Gratia farm (faith-based farm with large CSA and mission to donate 15% back to hunger abatement programs)
- Mike and Debbie Funk of Funk's Grove (maple syrup)
- Sally Smith of Sally's Fields (small, diverse vegetable operation with a CSA)

- Becky Newton of Wren’s Gate Garden (cut flower farm and floral arrangements)
- Dustin Kelly of Autumn Berry Inspired (value added specialty crop producer making jam and other products from autumn olive)
- Chad Jones of Jones Country Gardens (vegetable producer and member of Legacy of the Land cooperative, also has CSA)
- Mariah and Greg Anderson of Mariah’s Mums and More (mums and vegetables)
- Amy Randazzo of Grani’s Acres (vegetable producer part of Legacy of the Land cooperative)
- Doug and Beth Rinkenberger of Garden Gate Farm (vegetables,

Specialty crop of the month were featured in the Buy Fresh Buy Local newsletter including: spaghetti squash, zucchini, kale, beets, arugula, basil, eggplant, kale, kohlrabi and asparagus.

In November, we organized an online ordering meeting with approximately 40 attendees. The results of the online ordering survey that was conducted by Illinois Institute for Rural Affairs were presented and a food hub consultant facilitated the meeting. As a result of the meeting, in January 2016, we organized a meeting with a small group of farmers who are interested in developing a cooperative similar to one of the presenters at the meeting.

GOALS AND OUTCOMES ACHIEVED

GOAL #1: Reach 20 chefs and encourage them to purchase local, specialty crops

PERFORMANCE MEASURE: Restaurants will be surveyed regarding their purchases and those

BENCHMARK: 0

TARGET: 15 new chefs begin purchasing local, specialty crops

We were able to reach 10 new chefs to purchase local, specialty crops. We began by setting up one-on-one meetings with chefs in Springfield, Champaign-Urbana, Peoria and Bloomington to share information about the availability of local specialty crops, consumer demand, seasonality, contact information and other relevant information that may be needed. 12 chefs made the commitment to sourcing local specialty crops on either a trial or on-going basis including: 2 restaurants in Champaign-Urbana, 1 food truck restaurant in Springfield and 4 restaurants in Bloomington-Normal and 5 restaurants in Peoria. As a result of the new relationships built with farmers, some restaurants began making local purchases on a regular basis while others were felt the benefits didn’t outweigh the extra effort that was required to purchase locally grown produce.

GOAL #2: Increase consumer knowledge of availability of specialty crops and how to utilize them

PERFORMANCE MEASURE: Assessment at cooking classes

BENCHMARK: 0

TARGET: 50 consumers with increased knowledge of varieties of specialty crops, where to get them and how to use them

Surveys were given at the conclusion of 3 of the cooking classes (85 people attending, with 47 surveys returned) which indicated the following:

- 100% of attendees would recommend the class to a friend
- 100% of attendees gained skills or knowledge about the preparation of specialty crops as a result of attending the class
- 42% of attendees tried something new to eat that they hadn’t tried before
- 57% of attendees plan to seek out more local specialty crops

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 with farmers market visits to 11 different farmers markets. In central Illinois we will target 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.

The economic impact is unknown as it is difficult to get farmers to report information about sales but we have received anecdotal evidence that there is positive impact of our work from farmers.

LESSONS LEARNED

Through this project, we did an extensive amount of direct outreach at farmers markets, conferences, public events, cooking classes and other similar events. The feedback that we received from participants in cooking classes or tastings at the farmers markets was overwhelmingly positive. At one event, a group of five people were talking about how they didn't like beets, but after tasting the prepared beets, they all agreed, "but I like *these* beets". We heard this again and again when sampling kale, arugula, eggplant and other less common produce. Farmers reported selling more of the particular item we sampled on that day. While difficult to measure, anecdotal evidence suggests that we were able to successfully introduce people to new foods and provide them with recipes and preparation information so that they could replicate these things at home.

One unexpected result of this project was the formation of a group of farmers who wants to cooperate to sell produce together to model after another cooperative group who presented at our meeting in November 2015. One of the difficulties of selling from farm to restaurant is that restaurants don't want to take the time to order from a lot of different farmers because they have to set up separate deliveries, process separate invoices, etc. We heard from chefs again and again "if only it were easier" or "if only there were some kind of online ordering system", I would buy more local produce. By cooperating together, pooling product and streamlining the ordering process, farmers have the opportunity to reach more producers.

We came just shy of reaching our goal of securing 15 new restaurants to source local by reaching 12. We think that one contributing factor is that we already have worked with a number of restaurants in this region who are now committed to buying local. Being based in Springfield, it was difficult to find new restaurants who might be open to sourcing local and there are the "usual suspects" who are already committed. Additionally there are relatively narrow parameters that seem to match for restaurants that are willing to buy local: 1. Can't be a chain or corporate restaurant, can't be fast food, can't have a really low price point (diners or cafeteria-style restaurants, for example). Restaurants that are willing to buy local tend to be locally owned, have a menu that changes seasonally and have a higher than average price point. This limits the number of restaurants that can be reached.

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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-15-26

Project Title: Assessing variability in vegetable crop yield and heavy metal contamination across the Chicago metropolitan region

Partner Organization: University of Illinois at Urbana – Champaign

Project Summary: There is limited information available to urban farmers and gardeners about the impact of the urban atmospheric and soil environment on the productivity and safety of their crops. The primary goal for this project was to determine the most productive vegetable crops and cultivars for farms in the Chicago region and to identify the environmental factors driving differences in yield among locations. Our second goal was to quantify possible recontamination of raised beds by measuring the concentration and bioavailability of heavy metals in raised-bed garden soils across the Chicago region. Yield of spring- and fall-planted crops were positively influenced by elevated temperatures in urban locations, but these same crops were often negatively influenced by elevated ozone in peri-urban locations. Summer-planted crops were less influenced by temperature, but yield increased in response to greater light exposure. In contrast to preliminary evidence and studies in other cities, soil lead content and bioavailability did not increase over a three-year period in any of the experimental gardens. This suggests that compost-based, raised-bed gardens with mulched walkways may help to mitigate heavy metal recontamination in urban agriculture. Project results were disseminated to urban agriculture stakeholders at Extension workshops, grower field days, and academic conferences.

Project Purpose:

Urban agriculture, the production and distribution of food within and around cities, is a growing sector of the local food system in Illinois and may help meet growing consumer demand for

fresh, local food. However, urban food production is still limited by a lack of scientific information on the impact of the urban environment on the productivity and safety of vegetable crops. Our current knowledge of vegetable crop physiology and yield potential has been obtained through field experiments in rural areas, but the urban growing environment is substantially different from the rural environment. Identifying the crops and cultivars most suited to a particular growing environment within and around cities will help to increase the productivity and profitability of vegetable growers in Illinois. Moreover, determining the environmental factors responsible for the variability in crop yield across a metropolitan region will aid in identifying and developing future sites for urban and peri-urban farms.

A second major challenge limiting the growth of urban agriculture in Illinois is the long-term persistence of heavy metals in the urban environment. Soil concentrations of lead and other heavy metals can be up to 20 times greater in urban relative to adjacent rural soils. As a result, most urban farmers in Illinois produce vegetables in raised-beds or controlled environments (e.g., hydroponics or aquaponics). Large outdoor urban farms use the “cap-and-fill” method to cap vacant urban lots with an impermeable barrier and fill the lot with 1-2 feet of rural top soil and compost. Growing vegetables in raised beds or cap-and-fill systems buries most soil contamination issues and provides a viable short-term solution; unfortunately, heavy metals in the urban environment can become air-borne (bound to fine dust particles) and recontaminate newly remediated urban farms. Previous studies have shown that heavy metal concentrations in raised-bed soils can double in a period of only four years. Atmospheric deposition of heavy metals on urban farms will likely be related to farm location relative to historically elevated soil concentrations of the pollutant (e.g., roads and industrial corridors) and areas of active soil disturbance (e.g., construction). Research-based knowledge about the distribution of heavy-metal

atmospheric deposition across a metropolitan region will aid in the development of best management practices for urban agriculture and improve the health and safety of the urban food system.

Specific objectives for this project were to:

- 1) Evaluate crop and cultivar yield response to altered environmental conditions along an urban to rural latitudinal transect through the Chicago metropolitan region.
- 2) Determine the relative influence of specific environmental factors (e.g., pollutants and weather) on crop yield.
- 3) Measure heavy metal recontamination of raised-bed garden soils located along an urban to rural latitudinal transect.
- 4) Increase specialty crop grower knowledge about crops and cultivars adapted for urban and peri-urban production and about spatial distribution of heavy metal recontamination in Chicago.

Project Activities: To accomplish project objectives, we managed six experimental raised-bed vegetable garden sites located across an urban to rural latitudinal transect (approximately 41° 50') in the Chicago metro region. The most urban site (relative to downtown Chicago) was located at the Garfield Park Conservatory and the most rural site was located 45 miles west at Kuiper's Family Farm in Maple Park, IL (Figure 3). The remaining four sites were located at the Growing Home Honore St. Urban Farm (urban), Cantata Adult Life Services (urban), Cantigny Park (peri-urban), and the St. Charles Horticultural Research Center (peri-urban). These experimental gardens were established in 2013 and data was collected through 2015.

Experimental garden sites contained 40 raised-bed pots filled with a uniform soil and compost-based potting mixture. Soil moisture was measured continuously and drip-irrigation maintained soil moisture near field capacity. Crop species treatments included beet, kale, Brussels sprouts, tomato, pepper, onion, and snap bean. Two cultivars of each crop species were included to assess genotype by environment interactions. Kale and onion are planted in early spring, harvested mid-summer, and subsequently replanted to beet and Brussels sprouts fall crops. Atmospheric and microclimatic data was collected at each site for temperature and relative humidity, wind speed and direction, light, carbon dioxide, and ozone. Crop yield was measured at all sites throughout the growing season. Atmospheric deposition and bioavailability of heavy metals in raised-bed gardens was quantified two times each year with Mehlich III soil extractions for lead and in situ estimates of heavy metal plant uptake using Plant Root Simulator (PRS) probes (Western Ag Innovations, Inc.).

The factors most strongly driving variability in vegetable crop yield across the Chicago metro region included light, ozone, and temperature. Spring- and fall-planted crops were most influenced by ozone (negative effect) and temperature (positive effect), whereas yield of summer-planted crops was largely driven by light (positive effect). Cool-season crops tested in this study seemed to benefit from the UHI effect and there were no measured biotic or abiotic factors that reduced yield or marketability of vegetables grown in urban gardens. Warmer temperatures, nineteen additional frost-free days, and observed yield increases of cool-season crops at urban garden locations in this study suggests urban farmers may plant crops earlier in the spring and be the first to market each season. Preliminary economic analysis suggests that, despite cases of increased urban yields, snap beans and Brussels sprouts would not be profitable crops for urban farmers because of greater land area requirements and relatively low market

value. Tomatoes will likely be the most profitable crop in any environment due to high market value, followed by peppers, kale, and onions.

Average soil lead levels across all sites, determined via Mehlich-3 extraction, were not different in fall 2013, spring 2014, or fall 2014 and averaged 11.4 mg kg^{-1} . However, soil lead increased to an average of 15.2 mg kg^{-1} in spring 2015. In fall 2015, the EPA 200.5 extraction method was used and average soil lead level across sites was 27.1 mg kg^{-1} . There was no difference among garden sites at any sampling interval, except in spring 2015 when lead was greatest at rural sites St. Charles and Kuiper's, and lowest at a peri-urban site, Cantigny. Overall, soil lead levels were much lower than EPA hazardous exposure guidelines of 400 mg kg^{-1} lead in soil throughout the entire experiment. Soil directly adjacent to raised-beds in this study was mulched with wood chips and most of the sites were at least partially surrounded by trees and fences, which could have helped to mitigate the aerial movement of contaminated aerosols. Moreover, raised-beds were 0.51 m tall, which may have helped to reduce surface-level movement of contaminated aerosols. Potential plant uptake of lead (Pb) was greater in soils at the most urban sites, Growing Home and Garfield, and a peri-urban site, Cantata, in June 2014. However, results of spring and fall soil incubations in 2015 were less conclusive, and Pb availability was only different at the Cantigny location (reduced compared to other gardens). Principle component analysis suggested proximity to the city center and crop species did not influence potential Pb uptake in raised-bed garden soils.

Goals and Outcomes Achieved: Our first research goal was to determine the most productive vegetable crops and cultivars for farms in and around Chicago, IL and to identify the environmental factors driving differences in yield among farms. Preliminary benchmark data suggested that certain crops are more productive in urban environments than rural. Our target

was to determine how yield response across urban, peri-urban, and rural locations varied among cultivars within a given crop species and which environmental factors were driving the variability in crops and cultivars across farms in and around Chicago. This information was measured according to the experimental steps outlined in the approach above. We determined that yield of cool-season crops including kale, Brussels sprouts, onion, and beet were typically greater in urban than rural gardens, but yield of warm-season crops including tomato, pepper, and snap bean were typically greater in rural compared to urban gardens. Temperature, light availability, and ozone were the most important factors for predicting yield response of each crop. Cultivar differences within crop species were only observed for tomato, beet, and snap beans.

Our second research goal was to determine the spatial distribution and bioavailability of heavy metals in raised-bed soils across an urban to rural transect in Chicago, IL. Previous studies have shown that raised-bed garden soils can become quickly recontaminated with heavy metals through the deposition of contaminated aerosols (e.g., particulate matter pollution). We targeted data collection to quantify the magnitude and rate of recontamination across urban, peri-urban, and rural farms in the Chicago metropolitan region. This information was determined according to the experimental steps outlined above. We determined that atmospheric deposition and recontamination of raised-bed garden soils in Chicago is a non-issue. Moreover, Pb soil concentrations and bioavailability in newly established raised-bed gardens is well below EPA thresholds.

Our outreach goal was to increase specialty crop grower knowledge about crops and cultivars adapted to their specific urban or peri-urban growing environment in the Chicago metro region, and about the susceptibility of their garden or farm to heavy metal recontamination and

plant uptake. Most growers were previously unaware that raised-bed gardens and farms can become recontaminated with heavy metals through atmospheric deposition. Our target was to educate over 100 urban farmers and gardeners in Chicago about the most productive vegetable crops for their location and the relative possibility of heavy metal recontamination. This outreach target was accomplished through Extension presentations at Garfield Park Conservatory, Cantata Adult Life Services, Cantigny Park, and the St. Charles Horticultural Research Center. Educational posters with project information and results were also displayed at each cooperating location. Lastly, project results were disseminated to educators and researchers at the 2016 Urban Food Systems Symposium and the 2015 Ecological Society of America annual meeting.

Beneficiaries: Project outreach activities targeted urban and peri-urban farmers and gardeners in Chicago and throughout Illinois, along with urban agriculture educators and researchers. Attendees of Extension presentations and field days benefited from research-based evidence and recommendations for which crops to plant in urban and peri-urban gardens. Attendees also received beneficial information about strategies to mitigate the potential recontamination of raised-bed garden soils. Specialty crop educators and researchers benefited from the project results and newly developed methodologies for studying urban crop ecophysiology. Two publications summarizing these research results have been prepared and submitted for peer-review. This project benefited a minimum of 170 specialty crop stakeholders and researchers, including 25 attendees at a presentation at Garfield Park Conservatory, 30 attendees at Cantata Adult Life Services, 35 at Cantigny Park, and 30 at the St. Charles Horticultural Research Center. Project results also benefited 50 specialty crop researchers in attendance at presentations at the 2016 Urban Food Systems Symposium and the 2015 Ecological Society of America annual meeting. Educational posters with project information and

results were also displayed at each cooperating location, reaching countless additional stakeholders.

Lessons Learned: We learned that environmental conditions across urban metropolitan regions are spatially and temporally heterogeneous, which makes predicting biological and soil responses difficult. In a three-year experiment, it was not uncommon to observe contradictory pollutant, microclimate, yield, or soil results in consecutive years. Thus, future experiments would benefit from a greater number of experimental locations (six were employed in this study across three seasons for a total of 18 site-years) to capture and potentially mute some of the inevitable variability. Of course, by expanding the number of locations it would be difficult to maintain an experimental area of this size (nearly 1,000 square feet of garden production at each location; seven crops by two cultivars by eight replicate blocks); instead, future research questions would need to be narrowed to focus on a single crop or soil response across many locations and years.

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Publications:

Wagstaff, R., A.S. Davis, J. Juvik, C. Bernacchi, and S.E. Wortman. 2016. Farming in the city:

How is vegetable production affected along an urban to rural environmental cline? *In preparation.*

Wagstaff, R., A.S. Davis, and S.E. Wortman. 2016. Effects of the urban environment on soil

chemical and microbial properties in a raised bed vegetable production system. *In preparation.*

FINAL REPORT SC-15-39

NAME OF RECIPIENT:

SOUTHERN ILLINOIS UNIVERSITY directed by Dr. Alan Walters

PROJECT TITLE:

Horseradish Breeding and Propagation Research

PROJECT SUMMARY:

Horseradish is an important specialty crop grown in Illinois with almost 2000 acres grown in the Mississippi valley region adjacent to St. Louis, Missouri. The survival of the industry is dependent upon new variety development, since being an asexually propagated crop, varieties run out and must be replaced every few years. University Variety development has been at the cornerstone of developing new horseradish varieties for the industry since the 1960s. Therefore, the purpose of this project was to continue to develop new varieties for the Illinois industry.

This was a two-year project and we followed each year through the process of breeding new Horseradish varieties. This includes making crosses in the greenhouse in spring, seed collection, development of seedlings, field planting of breeding materials at a grower location, maintenance of these field plots, digging and then evaluation of these materials, and selected materials placed in cold storage until the following year in which they will be field planted.

The project is somewhat similar to the 2013, 2014 projects (SC-13-21, SC-14-14), but was a further continuation of these projects in the development of breeding new varieties.

PROJECT APPROACH:

All Tasks from the work plan were completed, these included:

- 1) Development of seedlings in greenhouse under mist in late winter for May 2015 and 2016 field planting
- 2) Crossing of Horseradish Clones in Greenhouse in April 2015 and 2016
- 3) Planting of horseradish research test plot in May 2015 and 2016 at Don Willaredt's farm in Collinsville, IL
- 4) Plot maintenance activities in June, July, August, and September 2015 and 2016
- 5) Harvesting of test plot in early November 2015 and 2016 and associated selection of improved horseradish breeding materials to be field planted in 2016 and 2017
- 6) Grower twilight meeting at Heepke's farm in late November 2015 and December 2016 for growers to select potential new horseradish varieties for the industry that had been field tested and evaluated for several years.

Growers selected four clones to be increased as new horseradish varieties for the Illinois industry these are numbered selections and include 1203, 1206, 1207, and 1301. They were then sent to a local nursery for propagation purposes to increase plant numbers.

The monies spent for this project were related only to the development of new horseradish varieties in Illinois which will enhance the marketability of this crop. The salaries and contractual service monies spent for this project were for the work done to complete the project tasks.

The new varieties released during this project period were significant contributions to the Illinois Horseradish industry to insure that it maintains its stature as an important part of the Illinois Specialty Crop Industry. The project was a collaborative effort between SIUC and the horseradish growers of Illinois.

GOALS AND OUTCOMES ACHIEVED:

The primary goal and the measurable outcome as stated in our work plan was the development of 4 new Horseradish varieties. These new numbered selections are 1203, 1206, 1207, and 1301 that were released within the time-frame of this project. They should be in full production in Illinois within a few years, as it takes time to build up plant numbers of specific new horseradish varieties for full scale field production.

Horseradish Grower Evaluation of Potential New Clones – 2015.

Clone	Parent	Exterior Characters	Interior Characters	Taste Characters	Total Score	Potential Cultivar
1) 1201	(11-6 x 901)	2.8	3.2	2.4	2.8	1.9
2) 1202	[1573 x (315 x 761A)]	2.9	2.9	3.4	3.2	2.9
3) 1203	UNKNOWN	4.5	3.6	4.3	4.3	4.2
4) 1204	(11-6 x 901)	3.1	3.6	3.1	3.1	2.9
5) 1205	(11-6 x 901)	3.9	2.7	2.6	3.0	2.5
6) 1206	(11-6 x 901)	3.9	4.3	3.5	3.9	4.0
7) 1207	[15K x (315 x 761A)]	3.5	3.3	3.1	3.2	3.8

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 by growers as new varieties.

The clone 1203 had the highest rating as a potential cultivar at 4.2/5, while 1206 and 1207 were 4/5 and 3.8/5, respectively. A table has not yet been developed for the 2016 data. The horseradish industry will definitely benefit from these new varieties in the coming years, which will help to sustain this important Illinois specialty crop.

BENEFICIARIES:

The primary group that benefited from this project are the Horseradish Growers of Illinois. They form the core of a very important and traditional specialty crop that has been in production in Illinois for almost 150 years. There are about 30 horseradish growers with each employing several people in their operation with the resulting economic impact magnified in their communities. The industry itself brings in about 20 million in fresh horseradish root sales but this does not consider the influence of creating value-added products through processed products that are also made in Illinois, nor to the benefit of other salaried or hourly employees that work at various steps along the production/processing chain in the horseradish industry.

LESSONS LEARNED:

We had no unexpected delays, impediments or challenges that would prevent us to complete the goals for this project. All goals for this project were achieved. No unexpected outcomes were realized.

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Illinois Department of Agriculture Final Grant Progress Report

SC-15-39

NAME OF RECIPIENT

The Board of Trustees of the University of Illinois / University of Illinois Extension/Elizabeth Wahle

PROJECT TITLE

Horseradish Breeding and Propagation Research

PROJECT SUMMARY

Illinois horseradish production is concentrated in Madison and St. Clair Counties and accounts for approximately 60% of the US horseradish industry, with a crop value very conservatively estimated at \$7.2 million. The Horseradish Growers Conference was developed to disseminate research findings on an annual basis, reaching the majority of Horseradish growers and processors in North America. In addition to working closely with the Horseradish Growers of Illinois on program content, University of Illinois Extension solicits and edits articles for the annual Horseradish Research Review & Proceedings which is disseminated to participants at the Horseradish Growers Conference.

PROJECT APPROACH

The 2015 and 2016 IL Horseradish Growers Conferences were held January 22, 2015 and January 28, 2016, respectively. Twenty-two horseradish growers and processors attended in 2015 and thirty-three attended in 2016 for a one-day educational event, which included lunch. Face-to-face presentations in 2015 focused on soil fertility, horseradish disease management, irrigation management, insect scouting, and research updates on horseradish breeding and horseradish volunteer control, and a project investigating an environmentally friendly antifungal agent. The program in 2016 focused on weed management systems utilizing trait technology within rotations, postharvest handling of horseradish, updates on the implementation of the FDA Produce Safety Rule, insect scouting and research updates related to horseradish breeding, volunteer horseradish control and horseradish internal root discoloration.

Elizabeth Wahle coordinated the conferences, including contacting and scheduling speakers, program registration, site coordination, refreshments and meal, and conducting an evaluation.

GOALS AND OUTCOMES ACHIEVED

Of the 27 attendees at the 2015 IL Horseradish Growers Conference, 9 completed the evaluation form provided. All reported learning valuable information, including: how to better use irrigation equipment through the use of a soil moisture meter, methods to improve soil health including a cover crop in rotation with horseradish; best management practices for disease control, and new herbicides labels for use in horseradish. As a result of discussion during the program, many requested future programming/information on best storage management options for horseradish.

Of the 33 attendees at the 2016 IL Horseradish Growers Conference, 16 completed the evaluation form provided. All reported plans to do something new as a result of attending the 2016 program, including: utilizing new methods for removing field heat from horseradish more rapidly in order to

reduce crop loss and maintain quality during storage; initiating preparations to meet Produce Safety Rules within the Food Safety Modernization Act, effective January 1, 2016; and utilizing new weed management strategies in horseradish such a new herbicide chemistry and trait technologies available in other crop rotations. In addition, respondents who attended the year previous reported adoption of learned information, including: selecting and growing better performing horseradish cultivars, utilizing herbicide recommendations to improve horseradish yield, initiating an insect scouting program to target pesticide applications, and an overall better relationship within the horseradish industry.

BENEFICIARIES

The primary beneficiary of The Horseradish Growers Conference is the Illinois horseradish growers themselves, but also includes growers from California, Wisconsin and Ontario, Canada. In addition to the growers, commercial horseradish processors, horseradish researchers and representatives from the local agricultural support industries receive information to further support the overall horseradish industry. In the United States, an estimated 24 million pounds of horseradish roots are ground and processed annually to produce approximately 6 million gallons of prepared horseradish. Illinois horseradish growers account for over 14 million of those 24 million pounds of horseradish. Of the forty-six unique individuals attending one or both years of the project-funded conference, sixteen of those attended both years. Those in attendance represent the majority of horseradish grown in Illinois, California, and Wisconsin, with a farm gate value very conservatively estimated at \$12.5 million.

LESSONS LEARNED

Horseradish production nationally is a relatively small industry within the specialty crop arena and one of the issues the industry struggles with is maintaining research partners for horseradish research and/or production expertise. This project was designed as the centralized outreach component for all horseradish research and expertise, so that growers throughout North America could learn and benefit from results in a timely manner. The project ran successfully without issue.

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ADDITIONAL INFORMATION



*2015 Horseradish Growers
Conference: Update on
Horseradish Breeding Program
by Alan Walters, Southern
Illinois University*

FINAL REPORT

**Project Title: Screening Pumpkin Cultivars and Accessions
to Identify Resistance to Bacterial Spot Caused by
*Xanthomonas cucurbitae***

**FY 2014 SPECIALTY CROP BLOCK GRANT PROGRAM
– FARM BILL**

ILLINOIS STATE DEPARTMENT OF AGRICULTURE

FINAL REPORT

Project Code: SC-15-20

PROJECT COORDINATOR

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Original funding: 2014 for two year

Extension of research without additional funding: 2016

Period: 3 years (January 2015 – December 2017)

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Screening of Pumpkin Cultivars/Accessions for Resistance to *Xanthomonas cucurbitae*

Screening in 2015

In 2015, we collected more than 600 accession/cultivars of pumpkins and other cucurbits from USDA and seed companies for screening for their resistance to *Xanthomonas cucurbitae*. We carried out screening of accession/cultivars in a greenhouse and in a field. A virulent isolate of *X. cucurbitae* from Illinois was used for screening the accessions in both the greenhouse and the field. A total of 243 accessions were screened in the greenhouse and 200 accessions of those screened in the greenhouse were also screened in the field for resistance to *X. cucurbitae*.

Greenhouse screening. Accessions were grown in a greenhouse, true leaves of the plants were inoculated with *X. cucurbitae*, and the leaves were accessed for the incidence and severity of bacterial spot. Seeds of each accession were planted in a flat (one seed per well). Plants were grown in a greenhouse at 24 to 28°C until they had four true leaves. Four seedling of each accession were inoculated with *X. cucurbitae*. In addition, four seedlings were treated with water as control plants. *X. cucurbitae* was cultured on Lauria Bertani agar medium (LB) in Petri plates in the dark at 24±1°C for 48 h. Suspension of the bacterium was prepared in sterilized distilled water (SDW). The density of bacterial cells in the suspension was adjusted to 10⁸ cfu/ml using a spectrophotometer at OD₆₀₀ (OD = 0.5 at 600 nm). Using a 1-ml syringe, 0.1 ml of bacterial suspension was infiltrated into the abaxial side of leaves, with three inoculations per leaf. Four plants and two leaves of each plant were inoculated. Inoculated and control plants were maintained in the greenhouse for 10 days. The number of lesions developed was recorded every other day following the inoculation. The diameter of the lesion and halo around the lesion were measured 10 days after inoculation.

Inoculated plants of all of the tested accessions developed typical bacterial lesion, but the lesions were smaller, slowly developing, and with more yellow tissues than necrotic tissues in the following accessions: 26, 27, 30, 38, 41, 73,77, 100, 104, 114, 117, 147, 149, 156, 166, 174, 176, 179, 186, 195, 213, 218, 221, 230, 232, 234, and 236. These accessions were considered with possible resistance to *X. cucurbitae*. Greenhouse screening is only complementary to field screening, thus the results of field screening indicated whether or not these accessions were resistance to *X. cucurbitae*.

Field screening. In June 2015, 200 of 243 accessions screened in the greenhouse were considered for screening in the field. Seeds were planted in flats in the greenhouse, and 12 plants (3-week-old) of each of 200 accessions were transplanted in each plot at the University of Illinois Vegetable Research Farm in Champaign (200 plots, each with 12 plants). In addition to the natural infection with *X. cucurbitae*, artificial inoculum of the *X. cucurbitae* isolate, which was used in the greenhouse, was prepared (10^8 cfu/ml) and plants were inoculated (200 ml inoculum per 12 plants) on 17 August, when most of the plants had fruit bigger than a baseball. Leaves of the plants were assessed for severity of bacterial spot on 5 September (19 days after artificial inoculation). Fruit were assessed for incidence and severity of bacterial spot during 28 September - 2 October, when fruit were mature. In each plot, leaves in four spots (three leaves in each spot, a total of 12 leaves) were examined and severity of bacterial spot in each of four spots was recorded. All of the fruits in each plot were examined, number of fruit with bacterial spot was recorded, and overall severity of bacterial spot in the fruit in each plot was assessed.

Bacterial spot developed on leaves of plants of all 200 accessions tested in the field. Severity of bacterial lesions on the leaves ranged from 2.0 to 26.25%. In 66, 112, and 22 plots severity of bacterial spot was 1-5, 5.1-10.0, and >10%, respectively. No fruit developed in one plot. In another plot, only a single fruit developed, but it rotted before maturing. As a result, no fruit data were recorded in two of 200 accessions. In 15 plots, no symptomatic fruit was observed. The accessions with no symptomatic fruit were 1, 4, 6, 36, 48, 57, 63, 72, 103, 107, 116, 145, 156, 195, and 196. Severity of bacterial spot in these accessions was $\leq 10\%$. Accession 195 was selected in the greenhouse study as possible resistant to *X. cucurbitae*. Severity of bacterial spot on the leaves of this accession in the field was 4.5%. Overall, the accession 195 is considered less susceptible to *X. cucurbitae*. Overall, fruit infection with *X. cucurbitae* is the most important for managing *X. cucurbitae* in cucurbits. Thus, finding 15 accessions with no bacterial lesions on fruit is promising results for possible cultivars resistant to *X. cucurbitae*.

Screening in 2016

Greenhouse screening. During 2016, 120 cultivars/accessions were processed for resistance to *Xanthomonas cucurbitae*. Seeds were sown in small pots in flats containing steamed soil mix (soil:sand:peat; 1:1:1). Plants were grown in a greenhouse at 24 to 28°C. Seeds of five accessions did not germinate or only a few seeds germinated (not enough plants for accurate data collection). True leaves of the plants were inoculated with *X. cucurbitae*. Development of bacterial lesions was recorded during 10 days following the inoculation. Data were collected from 115 cultivars/accessions. *X. cucurbitae* was cultured on Luria Bertani agar medium (LB) in Petri plates in the dark at $24 \pm 1^\circ\text{C}$ for 48 h. Suspension of the bacterium was prepared in SDW. The density of bacterial cells in the suspension was adjusted to 10^8 cfu/ml using a spectrophotometer at OD_{600} ($\text{OD} = 0.5$ at 600 nm). Using a 1-ml syringe, 0.1 ml of bacterial suspension was infiltrated into the abaxial side of leaves, with three inoculations per leaf. Four plants and two leaves of each plant were inoculated with the bacterium. Leaves of the control plants were infiltrated with SDW. Inoculated and control plants were maintained in the greenhouse for 10 days. The number of lesions developed was recorded every other day following the inoculation. The diameter of the lesion and halo around the lesion were measured

10 days after inoculation. In the greenhouse study, none of the tested 115 cultivars/accessions showed resistance to *X. cucurbitae*.

Field screening. In June 2016, 117 cultivars/accession of pumpkins were considered for screening for resistance to *X. cucurbitae* in the field. The trial included 87 cultivars/accessions for the greenhouse screening in 2016 and 30 accessions from greenhouse screening in 2015.

Seeds were planted in flats in the greenhouse, and 12 plants (3-week-old) of each of the cultivar/accession were transplanted in each plot at the University of Illinois Vegetable Research Farm in Champaign. The seedlings were transplanted 18-inch apart in plots spaced 20 ft apart.

Five of the cultivars/accessions were lost because either the seeds did not germinate or seedlings died after transplanting. As a result, only 112 plots had actively growing plants. Six of 112 actively growing cultivars/accessions did not produce fruit, thus only 106 cultivars/accessions were evaluated for fruit infection.

In addition to the natural infection with *X. cucurbitae*, artificial inoculum of the *X. cucurbitae* isolate used in the greenhouse was prepared (5×10^7 CFU/ml), mixed with carborundum powder (0.5 g carborundum/liter inoculum), and sprayed onto plants (200 ml inoculum per 12 plants) on 19 August (at fruit setting of plants) using a backpack sprayer. Leaves of the plants were assessed for severity of bacterial spot on 10 September. Fruits were assessed for incidence and severity of bacterial spot during 8-14 October, when fruits were mature. In each plot, leaves in four spots (three leaves in each spot, a total of 12 leaves) were examined and severity of bacterial spot in each of four spots was recorded. All of the fruits in each plot were examined, number of fruit with bacterial spot was recorded, and overall severity of bacterial spot in the fruit in each plot was assessed.

Severity of bacterial spot on leaves ranged from 0 to 25%. Bacterial spot did not develop on leaves of seven cultivars/accessions. Incidence of fruit with bacterial spot in the plots ranged from 0 to 100%. Severity of bacterial spot on fruit ranged from 0 to 10%. Bacterial spot did not develop on fruits of nine cultivars/accessions. Two cultivars did not develop bacterial spot on leaves and fruit, thus these cultivars are considered resistant to *X. cucurbitae*.

Screening in 2017

Greenhouse screening. In 2017, 28 pumpkin cultivars/accessions were screened for resistance to *X. cucurbitae*. The screening process was as described for 2016 screening. Bacterial spots developed on the leaves of all plants of cultivars/accessions screened.

Field screening. We intended to have field screening of all 28 pumpkin cultivars/accessions screened in the greenhouse. We did not have enough plants of one cultivar for field screening, thus data were collected of only 27 of the pumpkin cultivars/accessions. In addition to natural infection with *X. cucurbitae*, plants were inoculated with *X. cucurbitae* at fruit set and fruit maturing, as described in 2015 and 2016. Bacterial spot developed on leaves of all of the plants, but severity of the spots on leaves of one cultivar was low (3. 25%). Bacterial spot did not develop on fruits of this cultivar. In addition, bacterial spot did not develop on fruits of other two cultivars. We concluded that three of 27 cultivars/accessions were resistant to bacterial spot.

Presentation of the Results to Growers, Extension Educators, Industry Personnel, and Scientists

1. Babadoost, M. 2016. Identification and managing cucurbit diseases. Illinois specialty growers. Springfield, Illinois; January 6, 2016. 120 people attended.
2. Babadoost, M. 2016. Management of cucurbit diseases. Amish growers of Central Illinois. Arthur, Illinois; February 7, 2016. 42 people attended.
3. Babadoost, M. 2016. Disease management of cucurbits. Southern Illinois Vegetable School. O'Fallon, Illinois; February 9, 2016. 58 people attended.
4. Babadoost, M. 2016. Management of cucurbit diseases. Mennonite growers of South-Central Illinois. Vandalia, Illinois; February 13, 2016. 18 people attended.
5. Babadoost, M. 2016. Cucurbit diseases updates. Northern Illinois and Southern Wisconsin vegetable growers. Rockford, Illinois; February 25, 2016. 34 people attended.
6. Babadoost, M. 2016. Cucurbit diseases updates. Vegetable growers of North-East Illinois. Bourbonnais, Illinois; February 26, 2016. 29 people attended.\
7. Babadoost, M. 2016. Survival of *Xanthomonas cucurbitae* in the field. Cucurbitaceae-2016. Warsaw, Poland; July 26, 2016. 175 people attended.
8. Babadoost, M. 2016. Pumpkin diseases: Identification and management. Mt. Vernon, Illinois; August 31, 2016. 108 people attended.
9. Babadoost, M. 2017. Management of powdery mildew and other diseases of cucurbits. Indiana vegetable growers. Schererville, Indiana; January 5, 2017. 104 people attended.
10. Babadoost, M. 2017. Biotic and abiotic disease management of cucurbits. Illinois specialty growers. Springfield, Illinois; January 13, 2017. 42 people attended.
11. Babadoost, M. 2017. Managing cucurbits diseases. Northern Illinois and Southern Wisconsin vegetable growers. Rockford, Illinois; February 13, 2017. 36 people attended.
12. Babadoost, M. 2017. Updates on cucurbit diseases. Southern Illinois Vegetable School. O'Fallon, Illinois; February 15, 2017. 48 people attended.
13. Babadoost, M. 2017. Bacterial spot (*Xanthomonas cucurbitae*): An emerging disease of cucurbits. 2nd international conference Plant Physiology and Pathology at Bangkok, Thailand; June 26-28, 2017. 58 people attended.

14. Babadoost, M. 2017. Progress in managing bacterial spot of cucurbits, caused by *Xanthomonas cucurbitae*. Annual meeting of the American Phytopathological Society, San Antonio, TX; August 6, 2017. 1,400 people attended.
15. Babadoost, M. 2017. Bacterial spot of cucurbits (*Xanthomonas cucurbitae*): A serious emerging disease and progress for management. Annual meeting of the American Society for Horticultural Sciences, Hawaii, Hawaii; September 22, 2017. 72 people attended.

Future Research Needed

- Bacterial spot is a serious emerging disease on pumpkins and winter squash.
- More cultivars/accession of cucurbits are available for screening for resistance to *Xanthomonas cucurbitae*. However, our time and funding did not allow us to screen all available cultivars/accession. Further screening of cultivars/accession is suggested.
- Our studies showed some of the screened cultivars/accession less susceptible to *Xanthomonas cucurbitae*. Additional screening and molecular analyses of these cultivars/accession are needed to determine their use in breeding for resistance to *Xanthomonas cucurbitae*.

Project Title: Assessing variability in vegetable crop yield and heavy metal contamination across the Chicago metropolitan region

Partner Organization: University of Illinois at Urbana – Champaign

Project Summary: There is limited information available to urban farmers and gardeners about the impact of the urban atmospheric and soil environment on the productivity and safety of their crops. The primary goal for this project was to determine the most productive vegetable crops and cultivars for farms in the Chicago region and to identify the environmental factors driving differences in yield among locations. Our second goal was to quantify possible recontamination of raised beds by measuring the concentration and bioavailability of heavy metals in raised-bed garden soils across the Chicago region. Yield of spring- and fall-planted crops were positively influenced by elevated temperatures in urban locations, but these same crops were often negatively influenced by elevated ozone in peri-urban locations. Summer-planted crops were less influenced by temperature, but yield increased in response to greater light exposure. In contrast to preliminary evidence and studies in other cities, soil lead content and bioavailability did not increase over a three-year period in any of the experimental gardens. This suggests that compost-based, raised-bed gardens with mulched walkways may help to mitigate heavy metal recontamination in urban agriculture. Project results were disseminated to urban agriculture stakeholders at Extension workshops, grower field days, and academic conferences.

Project Purpose:

Urban agriculture, the production and distribution of food within and around cities, is a growing sector of the local food system in Illinois and may help meet growing consumer demand for fresh, local food. However, urban food production is still limited by a lack of scientific

information on the impact of the urban environment on the productivity and safety of vegetable crops. Our current knowledge of vegetable crop physiology and yield potential has been obtained through field experiments in rural areas, but the urban growing environment is substantially different from the rural environment. Identifying the crops and cultivars most suited to a particular growing environment within and around cities will help to increase the productivity and profitability of vegetable growers in Illinois. Moreover, determining the environmental factors responsible for the variability in crop yield across a metropolitan region will aid in identifying and developing future sites for urban and peri-urban farms.

A second major challenge limiting the growth of urban agriculture in Illinois is the long-term persistence of heavy metals in the urban environment. Soil concentrations of lead and other heavy metals can be up to 20 times greater in urban relative to adjacent rural soils. As a result, most urban farmers in Illinois produce vegetables in raised-beds or controlled environments (e.g., hydroponics or aquaponics). Large outdoor urban farms use the “cap-and-fill” method to cap vacant urban lots with an impermeable barrier and fill the lot with 1-2 feet of rural top soil and compost. Growing vegetables in raised beds or cap-and-fill systems buries most soil contamination issues and provides a viable short-term solution; unfortunately, heavy metals in the urban environment can become air-borne (bound to fine dust particles) and recontaminate newly remediated urban farms. Previous studies have shown that heavy metal concentrations in raised-bed soils can double in a period of only four years. Atmospheric deposition of heavy metals on urban farms will likely be related to farm location relative to historically elevated soil concentrations of the pollutant (e.g., roads and industrial corridors) and areas of active soil disturbance (e.g., construction). Research-based knowledge about the distribution of heavy-metal atmospheric deposition across a metropolitan region will aid in the development of best

management practices for urban agriculture and improve the health and safety of the urban food system.

Specific objectives for this project were to:

- 1) Evaluate crop and cultivar yield response to altered environmental conditions along an urban to rural latitudinal transect through the Chicago metropolitan region.
- 2) Determine the relative influence of specific environmental factors (e.g., pollutants and weather) on crop yield.
- 3) Measure heavy metal recontamination of raised-bed garden soils located along an urban to rural latitudinal transect.
- 4) Increase specialty crop grower knowledge about crops and cultivars adapted for urban and peri-urban production and about spatial distribution of heavy metal recontamination in Chicago.

Project Activities: To accomplish project objectives, we managed six experimental raised-bed vegetable garden sites located across an urban to rural latitudinal transect (approximately 41° 50') in the Chicago metro region. The most urban site (relative to downtown Chicago) was located at the Garfield Park Conservatory and the most rural site was located 45 miles west at Kuiper's Family Farm in Maple Park, IL (Figure 3). The remaining four sites were located at the Growing Home Honore St. Urban Farm (urban), Cantata Adult Life Services (urban), Cantigny Park (peri-urban), and the St. Charles Horticultural Research Center (peri-urban). These experimental gardens were established in 2013 and data was collected through 2015.

Experimental garden sites contained 40 raised-bed pots filled with a uniform soil and compost-based potting mixture. Soil moisture was measured continuously and drip-irrigation

maintained soil moisture near field capacity. Crop species treatments included beet, kale, Brussels sprouts, tomato, pepper, onion, and snap bean. Two cultivars of each crop species were included to assess genotype by environment interactions. Kale and onion are planted in early spring, harvested mid-summer, and subsequently replanted to beet and Brussels sprouts fall crops. Atmospheric and microclimatic data was collected at each site for temperature and relative humidity, wind speed and direction, light, carbon dioxide, and ozone. Crop yield was measured at all sites throughout the growing season. Atmospheric deposition and bioavailability of heavy metals in raised-bed gardens was quantified two times each year with Mehlich III soil extractions for lead and in situ estimates of heavy metal plant uptake using Plant Root Simulator (PRS) probes (Western Ag Innovations, Inc.).

The factors most strongly driving variability in vegetable crop yield across the Chicago metro region included light, ozone, and temperature. Spring- and fall-planted crops were most influenced by ozone (negative effect) and temperature (positive effect), whereas yield of summer-planted crops was largely driven by light (positive effect). Cool-season crops tested in this study seemed to benefit from the UHI effect and there were no measured biotic or abiotic factors that reduced yield or marketability of vegetables grown in urban gardens. Warmer temperatures, nineteen additional frost-free days, and observed yield increases of cool-season crops at urban garden locations in this study suggests urban farmers may plant crops earlier in the spring and be the first to market each season. Preliminary economic analysis suggests that, despite cases of increased urban yields, snap beans and Brussels sprouts would not be profitable crops for urban farmers because of greater land area requirements and relatively low market value. Tomatoes will likely be the most profitable crop in any environment due to high market

value, followed by peppers, kale, and onions.

Average soil lead levels across all sites, determined via Mehlich-3 extraction, were not different in fall 2013, spring 2014, or fall 2014 and averaged 11.4 mg kg^{-1} . However, soil lead increased to an average of 15.2 mg kg^{-1} in spring 2015. In fall 2015, the EPA 200.5 extraction method was used and average soil lead level across sites was 27.1 mg kg^{-1} . There was no difference among garden sites at any sampling interval, except in spring 2015 when lead was greatest at rural sites St. Charles and Kuiper's, and lowest at a peri-urban site, Cantigny. Overall, soil lead levels were much lower than EPA hazardous exposure guidelines of 400 mg kg^{-1} lead in soil throughout the entire experiment. Soil directly adjacent to raised-beds in this study was mulched with wood chips and most of the sites were at least partially surrounded by trees and fences, which could have helped to mitigate the aerial movement of contaminated aerosols. Moreover, raised-beds were 0.51 m tall, which may have helped to reduce surface-level movement of contaminated aerosols. Potential plant uptake of lead (Pb) was greater in soils at the most urban sites, Growing Home and Garfield, and a peri-urban site, Cantata, in June 2014. However, results of spring and fall soil incubations in 2015 were less conclusive, and Pb availability was only different at the Cantigny location (reduced compared to other gardens). Principle component analysis suggested proximity to the city center and crop species did not influence potential Pb uptake in raised-bed garden soils.

Goals and Outcomes Achieved: Our first research goal was to determine the most productive vegetable crops and cultivars for farms in and around Chicago, IL and to identify the environmental factors driving differences in yield among farms. Preliminary benchmark data suggested that certain crops are more productive in urban environments than rural. Our target was to determine how yield response across urban, peri-urban, and rural locations varied among

cultivars within a given crop species and which environmental factors were driving the variability in crops and cultivars across farms in and around Chicago. This information was measured according to the experimental steps outlined in the approach above. We determined that yield of cool-season crops including kale, Brussels sprouts, onion, and beet were typically greater in urban than rural gardens, but yield of warm-season crops including tomato, pepper, and snap bean were typically greater in rural compared to urban gardens. Temperature, light availability, and ozone were the most important factors for predicting yield response of each crop. Cultivar differences within crop species were only observed for tomato, beet, and snap beans.

Our second research goal was to determine the spatial distribution and bioavailability of heavy metals in raised-bed soils across an urban to rural transect in Chicago, IL. Previous studies have shown that raised-bed garden soils can become quickly recontaminated with heavy metals through the deposition of contaminated aerosols (e.g., particulate matter pollution). We targeted data collection to quantify the magnitude and rate of recontamination across urban, peri-urban, and rural farms in the Chicago metropolitan region. This information was determined according to the experimental steps outlined above. We determined that atmospheric deposition and recontamination of raised-bed garden soils in Chicago is a non-issue. Moreover, Pb soil concentrations and bioavailability in newly established raised-bed gardens is well below EPA thresholds.

Our outreach goal was to increase specialty crop grower knowledge about crops and cultivars adapted to their specific urban or peri-urban growing environment in the Chicago metro region, and about the susceptibility of their garden or farm to heavy metal recontamination and plant uptake. Most growers were previously unaware that raised-bed gardens and farms can

become recontaminated with heavy metals through atmospheric deposition. Our target was to educate over 100 urban farmers and gardeners in Chicago about the most productive vegetable crops for their location and the relative possibility of heavy metal recontamination. This outreach target was accomplished through Extension presentations at Garfield Park Conservatory, Cantata Adult Life Services, Cantigny Park, and the St. Charles Horticultural Research Center. Educational posters with project information and results were also displayed at each cooperating location. Lastly, project results were disseminated to educators and researchers at the 2016 Urban Food Systems Symposium and the 2015 Ecological Society of America annual meeting.

Beneficiaries: Project outreach activities targeted urban and peri-urban farmers and gardeners in Chicago and throughout Illinois, along with urban agriculture educators and researchers. Attendees of Extension presentations and field days benefited from research-based evidence and recommendations for which crops to plant in urban and peri-urban gardens. Attendees also received beneficial information about strategies to mitigate the potential recontamination of raised-bed garden soils. Specialty crop educators and researchers benefited from the project results and newly developed methodologies for studying urban crop ecophysiology. Two publications summarizing these research results have been prepared and submitted for peer-review. This project benefited a minimum of 170 specialty crop stakeholders and researchers, including 25 attendees at a presentation at Garfield Park Conservatory, 30 attendees at Cantata Adult Life Services, 35 at Cantigny Park, and 30 at the St. Charles Horticultural Research Center. Project results also benefited 50 specialty crop researchers in attendance at presentations at the 2016 Urban Food Systems Symposium and the 2015 Ecological Society of America annual meeting. Educational posters with project information and

results were also displayed at each cooperating location, reaching countless additional stakeholders.

Lessons Learned: We learned that environmental conditions across urban metropolitan regions are spatially and temporally heterogeneous, which makes predicting biological and soil responses difficult. In a three-year experiment, it was not uncommon to observe contradictory pollutant, microclimate, yield, or soil results in consecutive years. Thus, future experiments would benefit from a greater number of experimental locations (six were employed in this study across three seasons for a total of 18 site-years) to capture and potentially mute some of the inevitable variability. Of course, by expanding the number of locations it would be difficult to maintain an experimental area of this size (nearly 1,000 square feet of garden production at each location; seven crops by two cultivars by eight replicate blocks); instead, future research questions would need to be narrowed to focus on a single crop or soil response across many locations and years.

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Publications:

Wagstaff, R., A.S. Davis, J. Juvik, C. Bernacchi, and S.E. Wortman. 2016. Farming in the city: How is vegetable production affected along an urban to rural environmental cline? *In preparation.*

Wagstaff, R., A.S. Davis, and S.E. Wortman. 2016. Effects of the urban environment on soil chemical and microbial properties in a raised bed vegetable production system. *In preparation.*

FINAL REPORT CHECKLIST

SC-15-31

A final performance report must be received within 90 days after the end date of the signed grant agreement. The final report will be posted on the SCBGP-FB website and represents an important vehicle for sharing project findings and state successes with Federal and State agencies and with the public. Final performance reports must illustrate the completion of the activities and outcomes associated with each project within the grant agreement.

DEVELOPMENT

- Prior to submission of this report to the SCBGP, review the approved State Plan project proposal, subsequent approved amendments, approved Annual Performance Reports, invoices, payment requests, financial reports, and other relevant documentation.
- Review the report closely to ensure the project reports highlight their results and successes and are free from typographical errors, incomplete sentences, misspelled words, personal information, or derogatory comments about organizations or individuals. It should be remembered that the Final Performance Report is a reflection of your state's accomplishments and will be published on the Internet where it will be available to the public in their efforts to evaluate the effectiveness of the Specialty Crop Block Grant Program.
- Specific sections of the Final Performance Report should describe the final results of the project as proposed in corresponding sections of the State Plan project proposal. The chart below highlights the Final Performance Report section and the corresponding section in the State Plan project proposal or Annual Performance Report.

Final Performance Report Section	Corresponding State Plan (SP) / Annual Report (AR) Section
Project Title	Project Title (SP)
Partner Organization	Project Partner Organization (SP)
Project Summary	Abstract (SP)
Project Purpose	Project Purpose (SP)
Project Activities	Work Plan (SP), Activities Performed (AR)
Goals and Outcomes Achieved	Expected Measureable Outcomes (SP)
Beneficiaries	Potential Impact (SP)
Lessons Learned	Problems and Delays (AR)
Contact Information	None
Additional Information	None

PROJECT REPORT(S)

PROJECT TITLE

Asian Greens in Illinois Farmers Markets: A Market Analysis, Cultivar and Phytonutrient Study

- Provide the project's title. (Must be the same title used in the approved State Plan or amendment.)

PARTNER ORGANIZATION

Southern Illinois University at Carbondale

- Include the name of the organization that partnered with the State department of agriculture to lead and implement the project.

PROJECT SUMMARY

Asian greens (*Brassica rapa*) such as Bok Choy and Napa Cabbage can now be easily found in many marketplaces. However, the family of *Brassica rapa* has much more to offer in a variety of colors, shapes and sizes to fit a diversity of production and market niches. In this study, we explored the market potential of Asian greens at Illinois farmers markets to better understand what compels customers to buy an unfamiliar food and how to best support production and sales. In five field trials, 12-18 different cultivars were grown; three in summer and two in a winter high tunnel over two years. Yield data was collected for all cultivars and fresh weight assays were conducted for glucosinolate content mmol/g, total phenolics GAE mg/100g and ascorbic acid mg/100g for 5-8 cultivars. In three farmers markets throughout the state, cooking demonstrations and customer surveys were used to analyze purchasing habits to determine whether farmers market consumers were neophobic or neophilic and if these tendencies had an influence on consuming novel foods like Asian Greens.

In the field trials we found the highest producers to be Joi choi, Tokyo bekana, Mei quing choi and White flash with weights ranging from .111-.254 kg (about ¼ to ½ lb at full maturity) in the summer to about .069-.112 kg (about ¼ lb or less at full maturity) in the winter. We found that Yukina savoy and Tokyo bekana were a good source of glucosinolates as well as Vitamin green and Green wonder. Rosie and Hon tsai tai were found to have a higher source of total phenolics than other cultivars along with Green wonder and Vitamin green. These cultivars were also higher in ascorbic acid than others. In the neophilic study we found that the typical farmers market patron is more likely to be neophilic and more likely to purchase a novel food such as Asian Greens in the future. Yield and nutrient content information as well as seeds were shared with farmers at the Carbondale Community Farmers Market. Outreach efforts have included cultivar displays on four different dates at the Carbondale Community Farmers Market, a field day on Dec. 13th, 2016 and media exposure.

- Briefly summarize the project and its accomplishments in 200 words or less. This should be a self-contained description of the project suitable for dissemination to the public.

PROJECT PURPOSE

It was the purpose of this project to explore the production and market potential of Asian greens in Illinois Farmers Markets. Yield, nutrient content and an understanding of customer acceptance of these greens is lacking and needed to increase production and consumption of this nutrient dense and potentially profitable crop. Yield data is important for farmers to make informed decisions about whether a new crop is worth trying. By field testing 12-18 cultivars of Asian greens in five trials; three summer field trials and two winter high tunnel trials over two years, we worked to narrow down several consistently high-performing cultivars. To help farmers with marketing these greens we also performed glucosinolate, total phenolics and ascorbic acid assays and taste tested recipes at three farmers markets to better understand how open customers were to a new crop.

The average adult only consumes an average of 1.6 servings of vegetables per day, far from the 2.5 servings per day that is recommended. In recent years, there has been a huge increase in the number of new foods and food products available in the marketplace, often called novel foods. Much attention has been paid to the adoption of novel foods; however, little research has been conducted to study novel produce purchase at farmers markets. Food neophobia, the unwillingness to try unfamiliar foods, has been investigated as a possible cause to the high rejection rate of these novel foods.

The main goal of this study was to understand whether farmers market consumers were neophobic or neophilic and if these tendencies had an influence on consuming novel foods like Asian Greens. We wanted to know if recipes, samples, and/or nutrition education could increase the likelihood of purchasing a novel food like Asian Greens.

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

PROJECT ACTIVITIES

Field and High Tunnel Yield Trials- April Vigardt

Five trials were conducted of 12-18 different cultivars; three in the field in summer and two in the winter in a high tunnel to determine the yield potential of each. See Tables 1 and 2 for seeding, transplanting and harvest dates. In 2015 we conducted two summer trials, one harvested in May and the other in June. In 2016 we decided to not repeat the June trial due to a high level of plants going to seed as day length increased (bolting). Yield data and incidence of insect damage and bolting were collected and samples were selected for analysis of total glucosinolates and phenolics in 2015 and 2016 for both May and December harvests, and for ascorbic acid only in December 2015. Once data was collected, statistical analysis was run using JMP Pro 13 and Tukeys was used for means separation of yield and Students T for means separation for the nutrient assays.

2015 (Table 3) Analysis indicates that Joi choi, Tokyo bekana, White flash and Mei quing choi consistently had significantly higher yields than other cultivars across the three planting dates. Other high yielding cultivars include Komatsuna, Hiroshimanna. Many of these cultivars are in the *Brassica rapa var. chinensis* group which encompasses many of the Pac choi types people are already familiar with. Yields overall were highest in the May 21 trial and lowest in the Dec. 2 trial.

2016. (Table 4) In the May 21, 2016 trial 18 varieties were grown but in the December 13, 2016 trial only 12 varieties were grown due to poor germination and possible predation of seeds. In the December trial we were seven days late transplanting the seedlings into the high tunnel due to the need

to clear Bermuda grass from some areas of the beds and to have the greens on display for the field day on December 12, 2016. Transplanting to harvest was three days longer than in 2015. This increased their total growth days to 75 days, which is an increase of 10 days in 2016 than in 2015.

Yields in May 2016 were about 50% less than in 2015 possibly due to earlier bolting in 10 varieties compared to 2015 when bolting did not occur (Bolting occurred in Yu choy and Hon tsai tai in June 2015 trial. Yu choy and Hon tsai tai were not in May trial). 2016 December harvests yielded about the same or better than 2015 except for Tokyo bekana which yielded less.

The top four cultivars in yield were again Joi choi, Tokyo bekana, White Flash and Mei quing choi for May and December harvests. In comparing the two years, winter production yields were about 50 % less than summer yields for Tokyo bekana and Mei quing choi while Joi choi yields 57.3% and White flash yields 66.5% of their average summer weight in winter.

Further activities to promote Asian greens included three information tables at the Community Farmers Market in Carbondale on May 23rd, June 20th and Dec. 5th. In 2015. The greens were labeled on a table and a handout was given explaining the research grant, the different cultivars, where seeds can be bought and recipes developed by Sylvia Smith (see below). At the Dec. 5th market papers were placed beside the greens and people were asked to choose three of the 17 cultivars as the most visually appealing and then rank them 1-3 with 1 being the most appealing. Cultivars ranked highest were Tokyo bekana, and all of the red/purple cultivars (Rosie, Purple song, Red choi, Red pac). It warrants further study to see if salad mixes based on baby Tokyo bekana with baby leaves from these red/purple cultivars could help replace the basic lettuce salad mix available, possibly increasing the nutrient content of the salad mix and increasing production yields and season extension possibilities.

An information table was set up at the Community Farmers Market in Carbondale on Dec. 19th 2016 and the greens were labeled on a table and a handout was given with the results from 2015 and the yield and nutrient data for the May 2016 trial. Seed samples were given out to customers and other farmers present at the market. A field day was held at the high tunnel at the SIU Horticultural Research Center on December 12th. The field day was attended by seven local farmers interested in growing new varieties of Asian greens or expanding into growing greens. Free seed packs were handed out and all 12 varieties were placed out for taste testing. The response from the farmers was very favorable and varieties they were most interested in were Rosie, Tokyo Bekana, Mei Quing Choi and Yu Choy.

Nutrient Analysis- Ruplal Choudhary

2015. Total glucosinolate mmol/g of fresh wt., total phenolics GAE mg/100g of fresh wt. and ascorbic acid mg/100g fresh wt. assays were conducted by Ruplal Choudharys' team. We originally planned to use HPLC analysis for beta-carotene, lutein, and neoxanthin phytonutrients but scheduling was problematic with the HPLC team. To better indicate higher yields or increased nutrient content between the varietal groups (*chinensis*, *perviridis* and *narinosa*), we increased the cultivars assayed from the original four to six on the May 21st harvest and eight for the December 2nd harvest (Table 6). Statistical analysis was performed using JMP Pro 13 and means separation was performed using the Students T.

In the 2015 summer trial (Table 5) we found that total glucosinolates in Yukina savoy (11.27 mmol/g of fresh wt.) was significantly higher ($p < .001$) than the other cultivars except Tokyo bekana (8.89 mmol/g of fresh wt.) which was the second highest. Total phenolics were significantly higher ($p < .0001$) in Rosie (263.02 GAE mg/100g fresh wt.) than other cultivars except Yukina savoy (249.62 GAE mg/100g fresh wt) which was the second highest.

In the 2015 winter trial (Table 6) we found that again Yukina savoy (11.36 mmol/g of fresh wt.) was significantly higher ($p < .0001$) in glucosinolate content than other cultivars with Tokyo bekana the second highest at (8.45 mmol/g of fresh wt). For total phenolics Rosie (168.97 GAE mg/100g of fresh wt.) was significantly higher than all other cultivars except Hon Tsai Tai (158.49 GAE mg/100g of fresh wt.) which came in second. Differences in ascorbic acid content were not significant between the top three cultivars; Hon tsai tai, Vitamin green and Green wonder (61.51, 56.83, and 56.49 mg/100g fresh wt. AA) respectively but were

significantly different ($p < .0001$) from the lowest three Tokyo bekana, Joi choi and Yukina savoy with 32.43, 35.12 and 36.33 mg/100g fresh wt. AA content respectively. Nutrient information from the May 21 trial was shared in literature given to survey participants at the June 20 and June 27 farmers markets.

2016. Total glucosinolate mmol/g of fresh wt., total phenolics GAE mg/100g of fresh wt. assays were conducted by Ruplal Choudharys team. It was decided to not repeat the ascorbic acid assay due to issues with the equipment needed within the harvest window. We chose five cultivars for both the May 31 (Table 7) and December 13 (Table 8) harvests to perform the assays. Comparing the cultivars chosen for the summer trials for both years there were four constants (Joi choi, Tokyo bekana, Yukina savoy and Calton). We would have liked to trial Rosie again in 2016 but the sample was compromised. We added Vitamin Green because we thought we may see some interesting results. We dropped Sharaku because it was the least favorite amongst casual taste tests at the research center and the farmers markets. Comparing the cultivars selected for the winter trials there were five constants (Hon Tsai Tai, Joi Choi, Rosie, Tokyo Bekana and Green Wonder). Yukina Savoy was not included due to crop failure in the high tunnel. Statistical analysis was performed using JMP Pro 13 and means separation was performed using the Students T.

In the 2016 summer trial (Table 7) we found significant differences $p < .001$ in glucosinolate content between cultivars with Vitamin green (9.48 mmol/g of fresh wt.) the highest and Yukina savoy (8.68 mmol/g of fresh wt.) in second. Vitamin green (164.54 GAE mg/100g fresh wt) also had the highest total phenolics with Carlton (155.87 GAE mg/100g fresh wt) in second. Both cultivars were significantly different ($p < .001$) from Joi choi, Yukina savoy and Tokyo bekana with 127.42, 136.43, 136.61 GAE mg/100g fresh wt. respectively.

For the 2016 winter trial (Table 8) we saw a sharp reduction in glucosinolate content with no significant differences between the top three; Hon Tsai tai, Green wonder and Rosie with (2.68, 2.60, and 2.20 mmol/g of fresh wt.) respectively. For total phenolics we found the highest content in Green wonder, Hon tsai tai and Joi choi (227.13, 208.86, and 195.43 GAE mg/100g fresh wt.) respectively which were significantly different ($p < .0006$) from Rosie and Tokyo bekana (149.35 and 144.29 GAE mg/100g fresh wt.) respectively.

Neophilic Study of Asian Greens at Farmers Markets- Sylvia Smith

A survey was created to determine shoppers' level of neophobia, interest in recipes, nutrition information, and samples, and their familiarity and likelihood to purchase Asian Greens in the future. Pliner and Hobden's (1992) food neophobia scale was used. Three farmers markets were visited during the months of June and December 2015 in Illinois. 354 survey responses were collected; June 20th 114 surveys were collected at the Carbondale Farmers Market, June 27th 100 surveys were collected from the Aurora Farmers Market and on Dec. 5th 150 surveys were collected from the Champaign Urbana Farmers Market. Samples of an Asian green salad (recipe below) were handed out along with the survey to assess their familiarity with Asian greens, their rating of the taste and presentation of the salad and whether they would be willing to buy and use the greens in their own cooking. Data was analyzed using SPSS 22.0 for Windows. Frequencies and mean comparison tests were used to analyze farmers market shoppers neophobic tendency and willingness to purchase Asian Greens in the future. Significance was calculated at $p < 0.05$. From this study, the typical farmers market patron is more likely to be neophilic. Food familiarity is less important for high neophilic shoppers, while less neophilic shoppers require more exposure before purchasing. In addition, highly neophilic shoppers are more likely to purchase a novel food such as Asian Greens in the future. (Table 9).

Sylvia also helped to promote Asian greens in an early Saturday morning cooking show on WSIL.

Briefly describe the work accomplished during the grant period. What specific tasks from the Work Plan of the approved project proposal were accomplished throughout the project? Whenever possible, describe the work accomplished in both quantitative and qualitative terms, including any significant results, accomplishments, conclusions and recommendations resulting from the project. Be sure to include any favorable or unusual developments.

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

GOALS AND OUTCOMES ACHIEVED

Field Trials

Initially, the field trials were to have eight cultivars in each, one summer and winter trial each year for two years. We decided we had the field space and the student help to increase the number of cultivars from eight to 12-18 depending on the season and that this would be a good opportunity to obtain some baseline yield data. The field trials helped us to narrow down the highest and most consistent producers as being Joi choi, Tokyo bekana, Mei quing choi and White flash with weights ranging from .111-.254 kg (about ¼ to ½ lb at full maturity) in the summer to about .069-.112 kg (about ¼ lb or less at full maturity) in the winter. We observed large differences between the years for the summer plantings. This could be due to increased insect pressure on the 2016 May trial due to a four-day planting delay and ten day delayed harvest. More work will need to be done to determine the best planting date for different cultivars particularly those more susceptible to bolting due to day length change. Recommended future research would be to test Tokyo bekana as a salad green. Its higher yield and lettuce like appearance and taste worked well in the Student Sustainable Farm salad mixes, which were sold at farmers markets, and to the dining halls on campus. When mixed with Rosie and Yukina savoy we found that it made an attractive colorful salad mix with a difference of textures. The weights may be higher than lettuce based mixes with the added advantage of the glucosinolate rich Yukina savoy and Tokyo bekana and the phenolic rich Rosie.

Farmers as well as customers were exposed to the different cultivars at the farmers markets at the four information tables held and the field day. Some local farmers were experimenting with Asian green cultivars such as Komatsuna, Joi choi and Tat soi before. Many were appreciative of the seeds received for them to try and were interested in growing some greens as a baby mix to add to other salad mixes. Some farmers felt that it was harder to sell a mature bunch of greens than at the baby stage. One farmer resorted to making bouquets of the different colored leaves and textures, which were striking and sold well. However, more follow up is needed to really be able to determine if these greens are being grown more as a result of our outreach efforts and what further help these farmers may need.

The nutrient analysis goals changed most due to scheduling conflicts with the HPLC team. We decided that increasing the cultivars used and concentrating on glucosinolates, total phenolics and ascorbic acid content would give some good baseline data. We found that Yukina savoy and Tokyo bekana were a good source of glucosinolates as well as Vitamin green and Green wonder. Rosie and Hon tsai tai were found to have a higher source of total phenolics than other cultivars along with Green wonder and Vitamin green. These cultivars were also higher in ascorbic acid than others.

The neophilic study of Asian greens in farmers markets had a goal of conducting taste testings in four farmers markets. Due to timing constraints, three demonstrations were performed. Based on the 354 customer surveys collected, we found that farmers market customers were more likely to try new foods and crops. Taste testing can be a powerful way to convince a customer to buy an unknown food. Sylvia Smith used Tokyo bekana in a salad recipe, which was well received. The recipe was shared with other farmers at the market as well as with customers. She also appeared on a television cooking show promoting Asian greens.

- Describe the achievement of the performance goals and measurable outcomes identified in the approved project proposal and subsequent amendments and provide a comparison of actual accomplishments with the goals established for the project. This should include a comparison of baseline or benchmark data with quantifiable targets that was established prior to or in the initial phases of the project.
- Include any recommendations or conclusions that can be made based upon your data and project outcomes.
- If outcome measures are long-term, summarize the progress that has been made towards achievement and describe future activities that will be conducted after the project's completion to help lead to the fulfillment of the outcomes.

BENEFICIARIES

Farmers

About 17 small local farmers showed the most interest in growing Asian greens. They benefitted by seeing them grown to maturity in the field and presented at the farmers markets. They participated informally in the taste tests and were given greens to take home to try in their own recipes. The Student Sustainable Farm sold produce at the farmers market and we often served as the farm who could take the risk to try new crops on the public. We found that people enjoyed the baby Asian greens salad mixes and customers were more open to the idea of trying it. They also benefitted from the seed packets they received so they could do their own trials with less financial risks. The yield data, nutrient analysis and customer surveys will also benefit them in their decisions of which greens to grow and how they may market them to customers. We are hoping other farmers can also use this study to help their farm business.

Customers

It is estimated that about 750 customers attended the Carbondale Community Farmers Market per week. We displayed the greens four times at the market so about 2,900 people were exposed to Asian greens cultivars. For the neophilic study three farmers markets were visited with an average of 4,000 customers for a total of a possible 12,000 people at least seeing the greens at the market. 354 people taste tested the Asian green recipe at the farmers markets. Through growing the greens on the Student Sustainable Farm and selling them through our various markets we estimated we sold a total of 480 lbs of salad greens to the campus dining halls at an average of 20 lbs a week for 24 weeks a year (48 weeks for the duration of this project). Through our farmers market sales we sold about 540 lbs/yr (1080 lbs for the duration of the project) in a nine month production window. We had developed the salad mix and the other Asian greens stir fry mixes based on our preliminary research and experimentation that led to this grant. We used these products to help promote the greens at markets on and off campus. Our program also was covered in several media programs.

A morning television (WSIL) cooking program

An article in the SIU Daily Egyptian Newspaper

(<https://news.siu.edu/2015/12/120115amh15132.php>)

A news segment on WPSD Local 6 <https://www.wpsdlocal6.com/2015/12/03/asian-greens-growing-big-at-southern-illinois-university/>.

Other articles which appeared in the Southern Illinoian during this project

https://thesouthern.com/lifestyles/food-and-cooking/move-over-kale-make-room-for-asian-greens/article_263c3711-5a29-52b5-b7ff-24f594775625.html

Students

Students in the dining halls had not been exposed to these greens before in their menu options. From the chefs we learned that students were receptive to the greens. They were more receptive to the baby greens than when they were more mature. They thought students couldn't really tell the difference between the baby Tokyo bekana and the green lettuce. Students workers also on the farm benefitted from working with these greens and learning to identify and produce them. Throughout the course of this study, we had 12 student workers working at the farm with seven of them continuing in a profession in horticulture, farming or working in the health or culinary field. Several of these students said they would never go back to lettuce.

- Describe the specialty crop groups and other stakeholders that benefited from the completion of this project's accomplishments.
- How many benefited from the project?
- How did they benefit from the project?

LESSONS LEARNED

I think we achieved most of our outcomes and obtained important information on yields, glucosinolate, phenolic and ascorbic acid contents of some of these cultivars. We also obtained important insight into who our average farmers market customer is, that they are not as afraid to try new products and crops as some may think and that taste testing at markets could act as an important first step for many in trying something new. It would be interesting to see if more of these greens are being sold at markets and what information farmers may need to utilize more Asian greens into their production plans.

- If goals or outcome measures were not achieved, identify and share the lessons learned to help others expedite problem-solving.
- Describe any lessons you learned in the administration of the project that might be helpful for others who would want to implement a similar project.
- Lessons learned should draw on positive experiences (i.e., good ideas that improve project efficiency or save money) and negative experiences (i.e., lessons learned about what did not go well and what needs to be changed).

CONTACT PERSON

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- Name the Contact Person for the Project
 - Telephone Number
 - Email Address

ADDITIONAL INFORMATION

Please see separate attachments. Tables 1-9; pictures of Asian Greens and three recipes used in taste testing.

- Provide additional information available (i.e., publications, websites, photographs) that is not applicable to any of the prior sections.
- Be sure to include any documents, publications, or other attachments referenced throughout the report. If the attachments are large, the State Department of Agriculture should consider combining them as an appendix to the full report and submitting the appendix as a separate file.

Table 1 2015 Planting and Harvest Dates		
2015		
Field	Field	High tunnel
Trial 1	Trial 2	Trial 3
14 cultivars	14 cultivars	17 cultivars
Seeded 3/18 (35 d)	Seeded 4/21 (39d)	Seeded 9/29 (35d)
Transplant 4/21 (30d)	Transplant 5/28 (20d)	Transplant 11/4 (27d)
Harvest 5/21	Harvest 6/18	Harvest 12/2
Total days 65	Total days 59	Total days 62

Table 2 2016 Planting and Harvest Dates	
2016	
Field	High tunnel
Trial 4	Trial 5
18 cultivars	12 cultivars
Seeded 3/22 (35d)	Seeded 9/29 (42d)
Transplant 4/21 (30d)	Transplant 11/11(32d)
Harvest 5/31	Harvest 5/31
Total days 62	Total days 75

Table 3 2015 Yields (kg) Means separation Tukeys. Same letters are not significantly different from eachother. For all three harvest dates P<.0001.									
Cultivar	5/21/2015			6/18/2015			12/2/2015		
	Tukeys	Mean	Std. dev.	Tukeys	Mean	Std. dev.	Tukeys	Mean	Std. dev.
Carlton	bc	0.099	0.034	.	.	.	ef	0.064	0.016
GrWonder	bc	0.112	0.035	de	0.112	0.046	def	0.064	0.025
Hiroshimanna	bc	0.128	0.053	bc	0.147	0.055	bc	0.087	0.022
HonTSaiTai	.	.	.	de	0.108	0.054	efg	0.058	0.015
JoiChoi	a	0.243	0.117	a	0.208	0.074	a	0.108	0.023
Komatsuna	bc	0.136	0.044	cd	0.139	0.055	.	.	.
MeiQuing	a	0.252	0.078	cde	0.131	0.045	de	0.069	0.017
Mibuna	bc	0.083	0.055	de	0.105	0.048	efgh	0.057	0.018
PurpleSong	.	.	.	.	.	.	ghi	0.044	0.013
RedChoi	bc	0.131	0.068	.	.	.	hij	0.041	0.015
Red Komatsuna	.	.	.	.	.	.	j	0.028	0.024
RedPac	.	.	.	.	.	.	ij	0.035	0.010
Rosie	bc	0.094	0.035	fg	0.067	0.022	hij	0.042	0.008
Sharaku	bc	0.093	0.037	cde	0.124	0.032	.	.	.
TBekana	a	0.254	0.133	ab	0.178	0.060	ab	0.097	0.028
VitGrn	bc	0.120	0.039	g	0.059	0.039	cd	0.079	0.029
WhtFlash	a	0.209	0.108	a	0.184	0.052	bc	0.089	0.023
YuChoy	.	.	.	de	0.109	0.040	ef	0.062	0.022
Yukina	c	0.080	0.034	ef	0.103	0.030	fgh	0.052	0.014

Table 4 2016 Yields (kg) Means separation Tukeys. Same letters are not significantly different from each other. For both harvest dates P<.0001.

Cultivar	31-May-16			12/13/2016		
	Tukeys	Mean	Std. dev.	Tukeys	Mean	Std. dev.
Carlton	cdef	0.065	0.027	.	.	.
GrWonder	ef	0.053	0.022	.	.	.
Hiroshimanna	def	0.060	0.028	.	.	.
HonTSaiTai	cdef	0.067	0.028	ef	0.056	0.023
JoiChoi	a	0.125	0.076	ab	0.112	0.030
Komatsuna	bcde	0.077	0.057	.	.	.
MeiQuing	a	0.111	0.045	bc	0.094	0.031
Mibuna	cdef	0.063	0.038	.	.	.
RedChoi	abc	0.095	0.036	de	0.070	0.026
Red Komatsuna	f	0.033	0.019	.	.	.
Red Pac	cde	0.070	0.037	f	0.035	0.015
Rosie	bcdef	0.067	0.027	f	0.042	0.011
Sharaku	ef	0.054	0.021	cde	0.073	0.029
TBekana	ab	0.118	0.059	cd	0.085	0.033
VitGrn	cde	0.074	0.046	ef	0.050	0.024
WhtFlash	cde	0.074	0.037	a	0.118	0.040
YuChoy	abcd	0.091	0.053	cd	0.086	0.040
Yukina	ef	0.047	0.029	.	.	.

Table 5 2015 Summer Total Glucosinolate and Phenolics in Asian Greens. Means separation Students T. Same letters are not significantly different from each other.

Group	Cultivar	May 21, 2015					
		Total Glucosinolate mmol/g of fresh wt. P<.0001	Std. dev.	Total phenolics GAE mg/100g of fresh wt P<.0001	Std. dev.		
<i>chinensis</i>	Joi Choi	6.19	<i>b</i>	2.87	215.35	<i>c</i>	7.04
	Rosie	5.11	<i>b</i>	3.46	263.02	<i>a</i>	9.30
	Tokyo Bekana	8.89	<i>ab</i>	3.44	212.69	<i>c</i>	3.36
<i>Perviridis</i>	Sharaku	5.10	<i>b</i>	2.64	244.72	<i>b</i>	8.07
	Carlton	5.90	<i>b</i>	2.76	211.82	<i>c</i>	4.03
	Yukina Savoy	11.27	<i>a</i>	2.24	249.62	<i>ab</i>	2.93

Table 6 2015 Winter Total Glucosinolates, Phenolics and Ascorbic Acid (AA) in Asian Greens. Means separation Students T. Same letters are not significantly different from each other.

Group	Cultivar	Dec. 2, 2015								
		Total Glucocinolate mmol/g of fresh wt.		Std dev.	Total phenolics GAE mg/100g of fresh wt		Std. dev.	AA mg/100g		Std. dev.
<i>chinensis</i>	Hon Tsai Tai	5.18	<i>de</i>	.715	158.487	<i>ab</i>	8.96	61.51	<i>a</i>	5.85
	Joi Choi	7.60	<i>bc</i>	.973	116.70	<i>d</i>	8.59	35.12	<i>b</i>	8.71
	Rosie	4.71	<i>ef</i>	.440	168.97	<i>a</i>	5.99	45.35	<i>ab</i>	8.47
	Tokyo Bekana	8.45	<i>b</i>	1.05	97.96	<i>e</i>	5.46	32.43	<i>b</i>	7.31
	Carlton	6.53	<i>cd</i>	1.20	98.90	<i>e</i>	7.07	46.14	<i>ab</i>	9.19
<i>Narinoso</i>	Vitamin Green	4.10	<i>ef</i>	.852	143.42	<i>bc</i>	6.62	56.83	<i>a</i>	10.10
	Green Wonder	3.46	<i>f</i>	.713	141.13	<i>c</i>	3.98	56.49	<i>a</i>	16.37
	Yukina Savoy	11.36	<i>a</i>	.731	136.48	<i>c</i>	15.90	36.33	<i>b</i>	6.37

Table 7 2016 Summer Total Glucosinolates and Phenolics in Asian Greens. Means separation Students T. Same letters are not significantly different from each other.

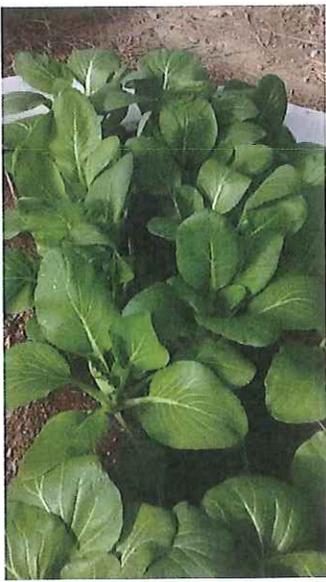
Group	Cultivar	May 21, 2016					
		Total Glucocinolate mmol/g of fresh wt. P<.001	Std. dev.	Total phenolics GAE mg/100g of fresh wt P<.001	Std. dev.		
<i>chinensis</i>	Joi Choi	5.74	<i>c</i>	.465	127.42	<i>b</i>	11.90
	Tokyo Bekana	6.19	<i>c</i>	.933	136.61	<i>b</i>	8.75
<i>Perviridis</i>	Carlton	7.90	<i>b</i>	.301	155.87	<i>a</i>	8.22
	Vitamin Green	9.48	<i>a</i>	.273	164.54	<i>a</i>	7.32
<i>Narinoso</i>	Yukina Savoy	8.68	<i>ab</i>	.316	136.43	<i>b</i>	17.45

Table 8 2016 Winter Total Glucosinolates and Phenolics in Asian Greens. Means separation Students T. Same letters are not significantly different from each other.

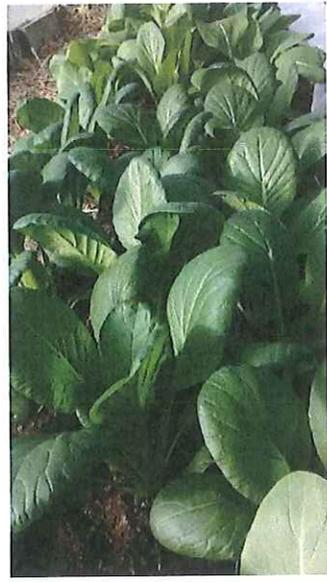
Group	Cultivar	Dec. 13, 2016					
		Total Glucocinolate mmol/g of fresh wt. P<.0001	Std. dev.	Total phenolics GAE mg/100g of fresh wt P<.0006	Std. dev.		
<i>chinensis</i>	Hon Tsai Tai	2.68	<i>a</i>	.48	208.86	<i>a</i>	56.01
	Joi Choi	1.47	<i>c</i>	.53	195.43	<i>a</i>	38.10
	Rosie	2.20	<i>ab</i>	.57	149.35	<i>b</i>	46.32
	Tokyo Bekana	1.63	<i>bc</i>	.37	144.29	<i>b</i>	25.91
<i>Narinoso</i>	Green Wonder	2.60	<i>a</i>	.63	227.13	<i>a</i>	29.90

Table 9. Results of Three Farmers Market Surveys in Illinois. Data was analyzed using SPSS 22.0 for Windows. Frequencies and mean comparison tests were used to analyze farmers market shoppers neophobic tendency and willingness to purchase Asian Greens in the future. Significance was calculated at $p < 0.05$.

Demographics of Survey Participants	Category	Valid Percent
Sex		
	Male	27%
	Female	73%
Age		
	18-34	26%
	35-50	24%
	51-69	40%
	70-87	10%
Education		
	Some High School	2%
	High School Diploma/ GED	7%
	Some College/ Trade School	19%
	Associate	7%
	Bachelor	28%
	Post- Graduate	38%
Income		
	25,000 or less	13%
	25,001- 59,999	28%
	60,000 - 74,999	12%
	75,000- 99,999	20%
	100,000- 149,999	19%
	150,000 +	10%
Race		
	American Indian/ Alaska Native/Pacific Islander	1%
	Black or African American	4%
	Hispanic/ Latino	5%
	White	79%
	Asian	5%
	Mixed Race	5%
	Other	1%



Green Wonder



Carlton



Yu Choy



Rosie



Red Choi



MeiQuingChoi



HonTsaiTai



JoiChoi



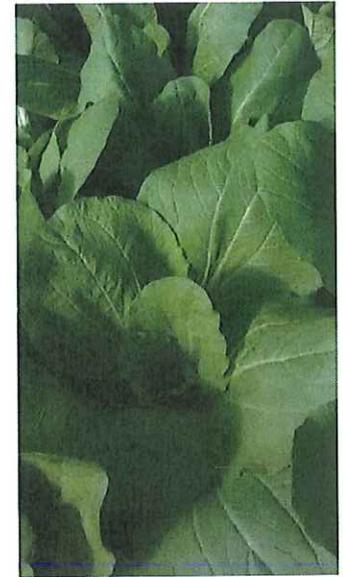
Purple Song



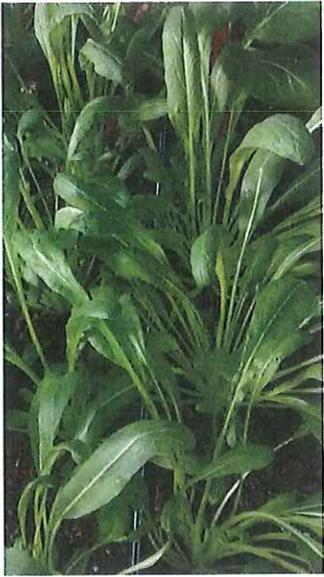
White Flash



Red Pac



Hiroshimanna



Mibuna



Vitamin Green



Yukina Savoy

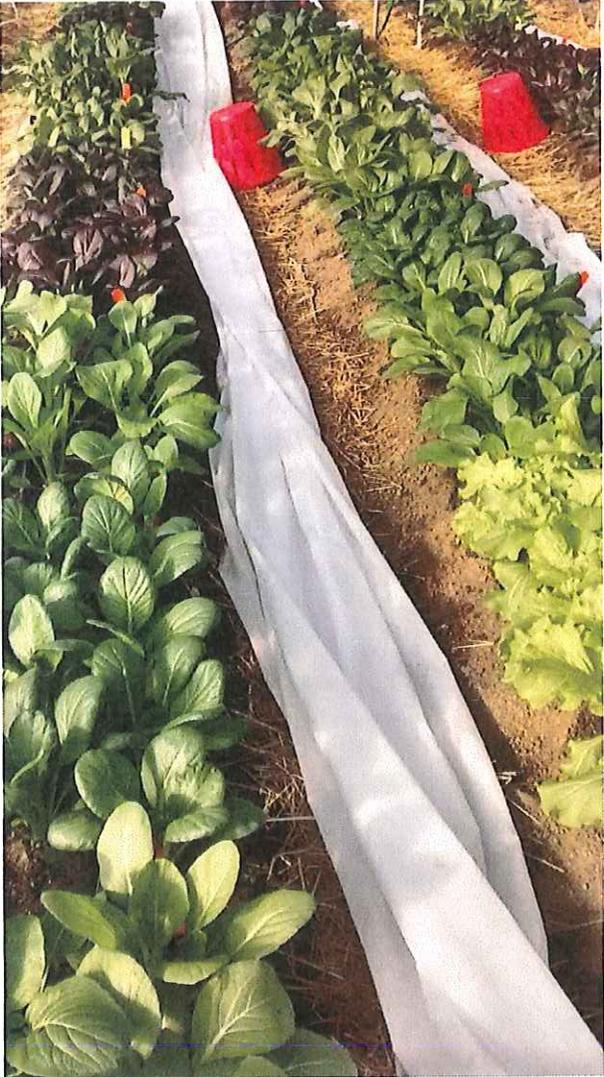


Tokyo Bekana



Red Komatsuna

Asian Greens Dec. 2 in the high tunnel. 62 days a after seeding/27 days after transplanting.



Asian Greens Salad

- 1 Bag of Tokyo Bekana
- 1 bunch Fresh Cilantro
- 1 bunch Green Onions

Prepare the Greens:

Cut the very end of the stem off all the Tokyo Bekana leaves. Coarsely chop the remaining leaves and stems into ½ inch pieces. If you are using scallions, cilantro or another vegetable, chop it up and add it to the choi. Wash the greens and get ready to toss them with the dressing.

Sesame dressing ingredients

- 2 Tablespoons red wine vinegar
- 1 Tablespoon rice vinegar
- 1 Tablespoon soy sauce
- ½ teaspoon sesame oil
- 2 Tablespoons canola oil
- 1 ½ teaspoons honey

Add all dressing ingredients to a bottle and shake, shake, shake.

The "Crunchies"

- 1 teaspoon canola or mild-tasting oil
- 1 bag of ramen noodles (organic or otherwise – use only the noodles, not the flavor packet)

Prepare the Crunchies:

Lay an unopened bag of ramen noodles on the counter or floor and whack them with a meat tenderizer until they are fully crushed. Careful, the bag might pop if you get too excited while you do this! Heat a skillet over medium-low heat and add the oil. When it is warm, pour in the crushed noodles, discarding the flavor packet. Add the almonds. Stir occasionally and cook until the noodles are just golden brown.

Combine everything in a salad bowl, toss and enjoy!

Nutrition Facts			
Serving Size 6 oz			
Servings Per Container 6			
Amount Per Serving			
Calories 105			
		% Daily Values*	
Total Fat 6g			9%
Saturated Fat 0g			0%
Trans Fat 0g			
Cholesterol 0mg			0%
Sodium 152mg			6%
Total Carbohydrate 9g			3%
Dietary Fiber 1g			4%
Sugars 3g			
Protein 2g			4%
Vitamin A 98%	•	Vitamin C 32%	
Calcium 6%	•	Iron 6%	
*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.			
	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Sat Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2400mg	2400mg
Total Carbohydrate		300g	375g
Dietary Fiber		25g	30g

Japanese Vegetable Pancakes with Bok Choy, Kale and Carrots
 Adapted, just a little, from Josher Walker of [Xiao Bao Biscuit](#), in
 Charleston, SC

Yield: 4 large pancakes or at least 12 smaller ones

Pancakes

- 1 Bag Bok Choi or Asian Green mix (4-5 cups shreds)
- 4 medium carrots, peeled into ribbons with a vegetable peeler
- Small bag of kale leaves, ribs removed, leaves cut into thin ribbons
- 4 scallions, thinly sliced on an angle
- 1 teaspoon kosher salt
- 1/2 cup all-purpose flour
- 6 large eggs, lightly beaten
- Canola, safflower or peanut oil for frying

Make the pancakes: Toss greens, carrot, kale, scallions and salt together in a large bowl. Toss mixture with flour so it coats all of the vegetables. Stir in the eggs. Heat a large heavy skillet on medium-high heat. Coat the bottom with oil and heat that too.

To make a large pancake, add 1/4 of the vegetable mixture to the skillet, pressing it out into a 1/2- to 3/4-inch pancake. Gently press the pancake down flat. Cook until the edges begin to brown, about 3 minutes. 30 seconds to 1 minute later, flip the pancake with a large spatula. Cook on the other side until the edges brown, and then again up to a minute more (you can peek to make sure the color is right underneath).

To make small pancakes, you can use tongs but I seriously find using my fingers and grabbing little piles, letting a little batter drip back into the bowl, and depositing them in piles on the skillet easier, to form 3 to 4 pancakes. Press down gently with a spatula to flatten slightly, but no need to spread them much. Cook for 3 minutes, or until the edges brown. Flip the pancakes and cook them again until brown underneath.

Serve pancakes with sauce and any of the other fixings listed above, from Japanese mayo to scallions and toasted sesame seeds.

Nutrition Facts	
Serving Size 1 pancake (94g)	
Servings Per Container 12	
Amount Per Serving	
Calories 95	
	% Daily Values*
Total Fat 5g	8%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 265mg	11%
Total Carbohydrate 5g	2%
Dietary Fiber 1g	4%
Sugars 2g	
Protein 5g	10%
Vitamin A 177%	•
Calcium 6%	•
	Vitamin C 28%
	Iron 6%
*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.	
	Calories 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2400mg 2400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g

Asian Green Risotto

Yield: 8-4oz. portions

Ingredients:

Asian Greens	1 bag (4 oz)
Mushrooms, chopped	2 oz
Stock	1.25 qt.
Butter	1 oz.
Onions, chopped	2 oz.
Carrots, finely chopped	1 oz.
Arborio Rice	6 oz.
Parmesan, Grated	1 oz.

Nutrition Facts	
Serving Size 4 oz (279g)	
Servings Per Container 8	
Amount Per Serving	
Calories 142	
	% Daily Values*
Total Fat 6g	9%
Saturated Fat 0g	0%
Trans Fat 0g	
Cholesterol 0mg	0%
Sodium 838mg	35%
Total Carbohydrate 21g	7%
Dietary Fiber 2g	8%
Sugars 2g	
Protein 5g	10%
Vitamin A 97%	•
Calcium 9%	•
	Vitamin C 28%
	Iron 6%
*Percent Daily Values are based on a 2,000 calorie diet. Your Daily Values may be higher or lower depending on your calorie needs.	
	Calories 2,000 2,500
Total Fat	Less than 65g 80g
Sat Fat	Less than 20g 25g
Cholesterol	Less than 300mg 300mg
Sodium	Less than 2400mg 2400mg
Total Carbohydrate	300g 375g
Dietary Fiber	25g 30g

Method of Preparation:

1. Bring the stock to a simmer
2. Heat the butter in a large, heavy saucepan. Add the onion, carrots and mushrooms sauté without browning.
3. Add the rice to the onion mixture. Stir well to coat the grains with butter but to not allow the rice to brown.
4. Add the stock 4 ounces at a time, stirring frequently. Wait until the stock is absorbed before adding the next 4 ounces.
5. After approximately 20 minutes all of the stock should be absorbed and the rice should be tender.
6. When rice is almost cooked (it should still be al dente), add the greens and fold them into the rice. Add a little more stock if the mixture becomes too dry. Continue to stir until the greens are cooked (another 5 minutes).
7. Remove from heat and stir in cheese.