

**FY 2012 SPECIALTY CROP BLOCK GRANT PROGRAM – FARM BILL
NEVADA STATE DEPARTMENT OF AGRICULTURE**

**Final Report
Agreement: 12-25-B-1474**

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Project Title

Carson School Specialty Crop Production & Work Experience Project

Project Summary

Initial purpose and specific issue, problem or need, importance and timeliness:

With the growing consumer demand for local food comes the need for trained individuals in the area of specialty crop production. At the start of this project, Northern Nevada Development Authority recognized specialty crop production as having a rejuvenating effect on the local economies of rural Nevada. Western Nevada College recognized the need for training by developing the Specialty Crop Institute whose mission is to “provide innovative training to northern Nevada farmers, helping them to succeed and to expand Nevada’s agriculture industry.” While the economic impact is difficult to measure, more new farms, greenhouses and hoop-houses are being constructed across the state. Farmers are enjoying extended growing seasons. New farms are emerging and farms are reporting increased sales to restaurants and retailers. More than 1,600 students have attended 24 workshops since the college’s program was created within its first four years.

Nevada Development Authority hosted the first meeting of the NNDA Agriculture Committee and identified the following goals. 1) Articulate the economic impact and benefits of agriculture industries from the local to the national level; 2) Better understand the Nevada agriculture industry to support it through collaboration, innovation and business backing; 3) Explore, identify and economically evaluate new crops and livestock opportunities; 4) Attract and develop processors to bring customers closer to producers; and 5) Attract manufacturers of agriculture equipment, tools and technology.

This project provided students a technical understanding and working knowledge of the greenhouse industry and specialty crop production. The Greenhouse Project utilized the Nevada School standards for Greenhouse Production and Management. Students gained knowledge and skills related to the care and management of gardens, small farms and greenhouses. Essential parts of this project were the leadership activities, record keeping and Supervised Agriculture Experience Program. The appropriate use of technology and industry-standard equipment was an integral part of this project. Upon successful completion of this course, students had acquired entry-level skills for employment in this field.

Project Approach

Activities Performed 2013:

Summer school course in Greenhouse Production and Management.

Eight students attended the summer school course lead by the Carson High School Ag teacher. Project application stated a minimum of 20 students would complete the summer class. Thirty-eight special needs students participated although they were not enrolled in the summer school class.

Students attained work experience. They acquired entry-level skills for employment as stated in the project application. All received summer school credit. All received “safe handling” cards, but were not old enough to take the state certification test for restricted use pesticides.

The University of Nevada Cooperative Extension Nursery Workers Certification program now called “Green Industry Training” has not been held since spring of 2013 (prior to the summer school class) and will not be held until spring 2014 due to budget cuts. Students could enroll in the program in spring of 2014. Project application stated, “All students will be provided the opportunity to take the nursery worker certification test.”

All created “College and Career Readiness” kits. They learned to prepare floral bouquets and created container flower gardens. The youth will learn good agricultural handling and greenhouse production techniques. Two students are doing Supervised Agriculture Experiences this fall, one in compost and another in medicinal herbs.

Seven students are doing agriculture senior projects in the 2013-14 school year. Topics range from hydroponic medicinal herbs, agri-tourism, greenhouse management, herbal tinctures and salves, permaculture, botany and culinary marketing.

Work Experience Component

Six students were interned through AmeriCorps from June to September. Project stated “Up to 10 students will apply and be selected to complete the work experience component.” However, 38 special needs students gained work experience on the project although they were not AmeriCorps interns.

They worked over 3,300 hours gaining in-depth technical experience in greenhouse operations and management; cut flower production; order fulfillment; customer relations and reporting. All worked hours at the Farmer’s Market with the Cut Flower Community Supported Agriculture Program

As of November 8, 2013, 3,114.5 pounds of vegetables were grown by the students participating in the project and donated to local food banks. They experienced the challenges of production and distribution of products, from the school garden program to the community and expanded food access for underserved community members. This grant helped to support an increase in consumption of nutritious vegetables by underserved community members.

Impacts of project: In the 2011 - 2012 school year at Carson High School there were 18 students involved in the school’s agriculture program. In 2012 – 2013, there were 74. After the summer school class and the work-study project there are now 156 students involved in the agriculture / horticulture program.

Partner contributions included:

The Greenhouse Project managed the fiscal component.

University of Nevada Cooperative Extension (UNCE) provided horticulture expertise and supervised the greenhouse manager and project activities. UNCE master gardener volunteers

volunteer weekly to keep the project adequately staffed. Carson High School provides the site for the Greenhouse Project. Carson City School District supported the project with maintenance. Carson City Parks and Recreation helped maintain the project. Farmer's Market allowed the students' Community Supported Agriculture (CSA) program to have information booths each week and distributed the cut flowers and herbs to CSA participants.

Activities Performed 2014:

Work Experience Component as of July 22, 2014

Three students were interned through AmeriCorps. Thirty-eight special needs students gained work experience on the project through the spring of 2014.

They worked over 3,300 hours gaining in-depth technical experience in greenhouse operations and management; cut flower production; order fulfillment; customer relations and reporting.

All worked to run the Community Supported Agriculture Program (CSA) from The Greenhouse Project, which had 12 subscribers for 20 weeks.

As of November 19, 2014, **4,573 pounds** of vegetables were grown by the students participating in the project and **3,256 pounds of that were donated** to local food banks and the balance supplied the CSA. . They experienced the challenges of production and distribution of products, from the school garden program to the community and expanded food access for underserved community members. This grant helped to support an increase in consumption of nutritious vegetables by underserved community members.

Impacts of project: There were seven senior projects in 2012-13 school year and eight in the 2013-14 school year. They covered topics such as permaculture, medicinal herbs, managing non-profits, greenhouse management, farm to table culinary crops and agritourism. The culinary arts students studied composting and contributed a regular supply of compostibles to TGP from their kitchen.

Partner contributions included:

The Greenhouse Project managed the fiscal component.

University of Nevada Cooperative Extension (UNCE) provided horticulture expertise and supervised the greenhouse manager and project activities. UNCE master gardener volunteers volunteer regularly to keep the project adequately staffed.

Carson High School provides the site for the Greenhouse Project.

Carson City School District supported the project with maintenance.

Carson City Parks and Recreation helped maintain the project.

Activities Performed 2015:

Work Experience Component as of August 31, 2015

Eight students were interned through AmeriCorps. Twelve special needs students gained work experience on the project through the spring of 2015.

AmeriCorps interns worked over 3,450 hours gaining in-depth technical experience in greenhouse operations and management; cut flower production; order fulfillment; customer relations and reporting. Special needs students worked 395 hours.

All worked to run the Community Supported Agriculture Program (CSA) from The Greenhouse Project, which had 10 subscribers for 20 weeks.

Students and interns raised 2,333 pounds of food and donated 1,539 pounds to food banks. 794 pounds were used to supply CSA subscribers.

Impacts of project: There were seven senior projects in 2012-13 school year, eight in the 2013-14 school year and two in 2014-15 school year. They covered topics such as permaculture, hydroponics, medicinal herbs, managing non-profits, greenhouse management, farm to table culinary crops and agritourism. The culinary arts students studied composting and contributed a regular supply of compostables to TGP from their kitchen.

Goals and Outcomes Achieved

Goal 1: *Improve access of fresh produce in underserved populations over 1000 pounds of fresh produce will be grown and distributed to community food banks and shelters by November 2013.*

In 2013, 3,114.5 pounds of vegetables were grown by the students participating in the project and donated to local food banks. They experienced the challenges of production and distribution of products, from the school garden program to the community and expanded food access for underserved community members. This grant helped to support an increase in consumption of nutritious vegetables by underserved community members.

In 2014, **4,573 pounds** of vegetables were grown by the students participating in the project and **3,256 pounds of that were donated** to local food banks and the balance supplied the CSA. . They experienced the challenges of production and distribution of products, from the school garden program to the community and expanded food access for underserved community members. This grant helped to support an increase in consumption of nutritious vegetables by underserved community members.

In 2015 Students and interns raised 2,333 pounds of food and donated 1,539 pounds to food banks. 794 pounds were used to supply CSA subscribers.

Goal 2: *Increase knowledge of specialty crop production. Up to 20 youth will be enrolled in the Summer School Greenhouse Management Class and complete the class June 10-September 30th, 2013.*

In the 2011 - 2012 school year at Carson High School there were 18 students involved in the school's agriculture program. In 2012 – 2013, there were 74. After the summer school class and the work-study project there are now 156 students involved in the agriculture / horticulture program.

In 2013, 59 students participated. Our project rekindled an interest in agriculture studies at Carson High School, resulting in the hiring of a full-time Ag teacher and helped to reinstate Future Farmers of America after many years in hiatus. 17 students implemented senior projects

centered on permaculture, hydroponics, medicinal herbs, greenhouse management, farm to table culinary crops and agritourism.

Eight students were interned through AmeriCorps. Twelve special needs students gained work experience on the project through the spring of 2015.

AmeriCorps interns worked over 3,450 hours gaining in-depth technical experience in greenhouse operations and management; cut flower production; order fulfillment; customer relations and reporting. Special needs students worked 395 hours.

Goal 3: *Expand Specialty Crop Production by educating, up to 14 Carson high school youth 17 years of age or older, will be hired through AmeriCorps and receive from 5-8 weeks of work experience training.*

Throughout the project, 17 students participated in the AmeriCorps program and received work experience under the Carson City Greenhouse project. This project has impacted participating youth through the AmeriCorps program, which has created/encourage next generation growers. Five students that completed the program obtained jobs in the specialty crop industry. One learned about farm management practices and at the end of his AmeriCorps internship first ran The Greenhouse Project operations for two years and then went on to manage a large specialty crop operation at the University of Nevada, Reno that educates current and future specialty crop growers and researches specialty crop markets in Nevada.

Goal 4: *Increase nutritional knowledge and consumption of specialty crops in the Carson Community, through information sharing of students and staff with parents and members of the community as well as the start-up of a CSA.*

This grant helped to support an increase in consumption of nutritious vegetables by underserved community members according to partners Ron Wood Family Resource Center, Friends in Service Helping, Salvation Army and Circles Initiative.

Lessons Learned

In 2013, University of Nevada Cooperative Extension conducted a post participation survey with the students and AmeriCorps interns. When asked to self-evaluate their knowledge prior to participating in this grant project, three students (out of nine total respondents) “knew nothing” and five “knew a little” about ag/horticulture. After participating, all nine students felt they now “knew a lot.” When asked about their interest in a career in agriculture or horticulture, four students said they “were interested in a career in ag or horticulture prior” to their participation in the project. One had “no interest” prior. In the post survey, three said they were “now interested in a career” after participating. One still was “not interested in a career.” Most strongly agreed they learned “that a healthy soil is the basis for growing healthy plants;” “how to set goals;” and “how to meet project goals.” Most agreed they had learned “how to raise vegetables successfully;” “how to raise flowers successfully;” and “how to work as a team.” Many commented that it was a great program and that more people should know about it. One said, “The greenhouse is an amazing learning opportunity no one should pass up.”

The lessons we learned from the survey are that students/interns find the opportunity for an agriculture experience invaluable and when given such an opportunity, youth often will choose to continue their agriculture education and possibly go on to a career in agriculture. Training at The Greenhouse Project provided students and interns with valuable job skill training with our graduates going on to head the greenhouse operations for a University of Nevada organic agriculture project, to become the paid greenhouse manager and educator for The Greenhouse Project, to work at local nurseries and in local botanical producers.

While we set out to reach 20 students in 2013, 59 students actually participated. Our project rekindled an interest in agriculture studies at Carson High School, resulting in the hiring of a full-time ag teachers and helped to reinstate Future Farmers of America after many years in hiatus. The number of students involved in the agriculture studies program at Carson High School continues to grow with 175 students now in the ag program at Carson High. We learned there is an ever-growing interest in agriculture studies by youth.

We also learned that age is a limiting factor in acquiring restricted use pesticide licenses. In addition, having a community garden open to the public on high school property is almost impossible due to the importance of keeping youth safe and the inability to screen all garden participants and limit their access to children. AmeriCorps was unable to supply a VISTA intern.

We learned about the challenges growing enough vegetables to supply a CSA for 20 weeks. Our project manager, students and interns learned how to harvest and how to process vegetables and cut flowers. They learned about order fulfillment, customer service and farm management.

The Greenhouse Project team learned that working with AmeriCorps interns is a positive and beneficial experience for us and them.

We were unable to create a family community garden due to liability constraints of non-background checked adults working around children (The Greenhouse Project is located at Carson High School).

Partner contributions included:

The Greenhouse Project managed the fiscal component.

University of Nevada Cooperative Extension (UNCE) provided horticulture expertise and supervised the greenhouse manager and project activities. UNCE master gardener volunteers volunteered regularly to keep the project adequately staffed.

Carson High School provides the site for the Greenhouse Project.

Carson City School District supported the project with maintenance.

Carson City Parks and Recreation also helped maintain the project.

Future Project Plans for 2015 through SCBGP award 14-SCBGP-NV-0032:

Continue “hiring” AmeriCorps interns to give work experience in specialty crop production while raising food for Carson’s food insecure.

Continue to teach greenhouse production and management to the Carson High Ag students and provide opportunities for their Supervised Agriculture Experiences and Senior Projects. Continue to educate elementary and middle school students on specialty crop agriculture.

Project Title:

Fallon Small Farm Collaborative

Project Summary

The purpose of this project was to continue and expand the Fallon Small Farm Collaborative that began as a result of Specialty Crop Block Grant SCBGP 12-25-B-0936 awarded in 2010. Nevada is sorely lacking in grass roots farmer-run marketing groups that are found in states with large small farm populations. This project was designed to build upon the groundwork of farmer cooperation in marketing efforts as established under the previous grant. Specifically the grant was to allow the development of a formal organizational structure (funded by farmers) and provide necessary supplies, start-up items and marketing assistance to expand the Collaborative both in numbers and venue opportunities for potential sales of specialty products. This project also aimed at increasing marketing knowledge and opportunities for small farmers that otherwise may not be able to do so individually.

Project Approach

Activities performed during the grant period included the development of branding materials for the markets, including logos, banners, flags, business cards and a Facebook page for the market operated by the Collaborative. All marketing materials were solely to promote specialty crop products and growers. Administrative activities included the following: selection of markets for participation, purchasing market space and sampling permits, scheduling farmers to transport and sell at the different markets, purchase and maintenance of market supplies including canopies and tables. Farmers and project staff also completed orientations with market managers on the collaborative model and encouraged them to participate by emphasizing the increase in Nevada farmers at their markets. NevadaGrown as a project partner provided consultation services in choosing markets, providing NevadaGrown marketing materials (flags & bags), attending markets, and in providing marketing suggestions. A favorable unforeseen development was the role CEDA played in developing an administrative support structure for the Collaborative as it developed and ran its own market in Fallon. The farmer cooperation and coordination activities were simplified through the use of CEDA conference room facilities, the development of an e-mail & telephone list of participating farmers, along with listserv notification capability of the CEDA office.

A development that was not anticipated was the group's decision to start their own market. This included the purchase of a City of Fallon business license for the Fallon Farm Collaborative and finding a non-profit organization to sponsor the market structure. The most important and limiting unusual development was the extended and devastating drought that hit area farmers. Previous reports have outlined the difficulty experienced in 2013 and 2014. In 2015 the drought worsened to the extent that some existing farmers were unable to grow crops and new farmers decided to wait out the drought before expanding into specialty crops. This created significant hardships on project participants.

Goals and Outcomes Achieved

The performance goals and measurable outcomes of this project were accomplished through the following activities:

Design, purchase and display of marketing materials to include signs, banners, logos for the collaborative.

- 1) Purchase of canopies and tables for use at farmers' Markets
- 2) Payment of fees for market spaces and sampling permits
- 3) Farmer collaboration in boxing, transporting and selling collaborative-grown products at area markets
- 4) Purchase and joint use of a precision specialty crop hand seeder
- 5) Development and operation of a Collaborative market in downtown Fallon

Goal and Achievements

Goal 1: Increase number of farmers from 14 in 2012 to 22 by October 2015.

Achievements: The achievement of this goal was significantly impacted by the severe drought experienced throughout the grant period. Efforts were made to keep existing farmers that had to stop production. In addition, potential new farmers were involved in meetings and planning collaborative efforts in the hopes the drought would end and they could participate. 2015 figures show that eight farmers actively participated in the markets in the Reno-Carson-Fallon area. We had a total of 20 farmers and potential farmers that were on our invite list to collaborative meetings all of whom participated at one time or another during the three year period. The goals specific to including participation from 6 farmers and in completing 24 markets were exceeded during the grant period. During the 2011 market year one farmer dropped out and the goal was missed by one. However, in 2012 several farmers were added to the group by expanding the markets served to include the Fall Victorian Square Market and the Slanted Porch market. Throughout the project, a total of thirteen farmers participated in the markets and 84 attended. Most farmers reported an increase in sales as a result of adding the new markets and through sharing the sales responsibilities with cooperating farmers. A core group of 6 farmers participated in multiple markets with the remainder participating in occasional markets.

Goal 2: Increase the access of the collaborative to new market venues and increase collaborative participation from three to five market channels.

Achievements: Farmer's markets (seasonal) were increased to five (5). The collaborative added the Summit Market in Reno along with Fallon, Carson, California Avenue (Reno) and the Cantaloupe Festival Farmer's Market. The Collaborative also participated in the Italian Festival Farmer's Market.

Goal 3: Increase production of specialty crops by providing farmers with equipment that otherwise would be unobtainable.

Achievements: A precision seeder was purchased and offered to participating farmers for use. Three sites chose to use the seeder – Pioneer Farms, Lattin Farms and High Desert Farming Initiative. An additional farmer (Workman Farms) utilized the research on choosing a seeder to purchase (same model) for their own use.

Goal 4: Expand market and branding of participating farmers through purchasing marketing/advertising materials.

Achievements: It has been difficult to quantify the increase in sales of participating farmers. Achievement of this goal was greatly hindered by the drought which prevented participation from larger producers and limited expansion by others due to the lack of water. Anecdotal data indicates increased sales at the Reno area markets due to the additional of a new market. Also, the joint effort at the Cantaloupe Festival Market and the Collaborative's advertising and promotion of the market was a great success. The three collaborative farmers (plus two value-added vendors using farmer products in their wares) grossed around \$13,000-\$15,000 for a two day event which is significant for small farmers.

Beneficiaries

Groups that benefited from the completion of this project's accomplishments.

As a direct result of this project area farmers were able to collaboratively market at seven different market venues by sharing space, cooperatively marketing, and by transporting produce. Farmers also sent produce through the collaborative to rural markets in Hawthorne, Fernley, Lovelock, Winnemucca and Battle Mountain. The farmers benefitted by gaining access to additional markets. The markets benefitted by having additional NevadaGrown specialty crop growers and products present at their markets. The Fallon community benefitted by the re-start of a market in the community. Farmer's market customers benefitted by increased access to fresh, local produce.

Quantitative data/ beneficiaries affected

Thirteen farmers attended at least one market over the season. A secondary benefit was the Collaborative's decision to sponsor their own market. It gave the participating farmers the opportunity to learn the process for participating in a farmers market. The collaborative formed an organizational structure, purchased a business license, obtained a fictitious name certificate from Churchill County, set up a bank account and ran a successful summer specialty crop market.

Lessons Learned

This project allowed participants to identify that encouraging farmers to collaborate on a common goal requires consistent facilitation and attention to detail. The logistics of attending markets over a broad geographic area requires advance planning and coordination. We also learned that some farmers believe they are ready to market, however they haven't quite learned how to plant, grow, harvest and prepare a crop for market. Further assistance with the pre-market planning and implementation would be beneficial for these relatively new growers.

Additional Information

A review of the work plan in the grant indicates some areas for clarification and comment. The first project activity was to establish a legal entity for the Collaborative. Although the timeline indicated it would be established by February 2013 it actually took the group until summer of 2015 to accomplish this goal. They chose to incorporate under Nevada law as a private for profit Limited Liability Company. This is considered a landmark decision, as hopefully it will allow the Collaborative to continue in business past the grant period. Also, within the work plan was the intent to develop an operating agreement, implementation strategy, and marketing plan.

While we did work on those issues no formal documents were created and will be left to the new LLC board of directors.

This report would be incomplete without a word about the relationship developed between the Collaborative and the Small Business Development Center. At least six of the participating farmers ended up as SBDC clients and many of the marketing type elements in the work plan ended up being handled by SBDC counselors with individual clients. This relationship will continue and will give the farmers additional long-term assistance in developing their businesses.

A positive outcome of this project was the development of a core group of farmers that recognized the advantages of group projects, including the opportunity to manage their own market. A hoped for but unexpected outcome of the project was the overall acceptance of the group marketing model by the Reno area market managers.

Project Title

Food Bank of Northern Nevada Farm-to-Hub Feasibility Study

Project Summary

Background:

Almost all of Northern Nevada and Northeastern California's agricultural food production occurs in rural areas, around small towns with limited markets for food. In order to increase the competitiveness and sales of specialty crops and thereby increase financial viability of specialty crop farmers, these farms need streamlined access to the customers of larger urban marketplaces. Great Basin Community Food Co-op, Nevada Grown, the Nevada Department of Agriculture and the Food Bank consistently hear from farmers in rural northern Nevada that one of the biggest hurdles for them (mostly small, family farms) is how to efficiently get their food to these urban marketplaces. Time on the road is time away from farming. They generally lack refrigerated trucks to transport product, and fuel costs are a significant factor.

Meanwhile, the Food Bank of Northern Nevada serves a very large, almost entirely rural geography (90,000 square miles, with all areas defined by community populations below 20,000, except Reno, Sparks and Carson City).

While headquartered in Storey County, the Food Bank is located near the largest urban community in this region, and collects food daily from retail and distribution donors in the immediate area, bringing it back to the warehouse in McCarran. The Food Bank then uses a fleet of refrigerated trucks to distribute that food to the far-flung rural communities in their service area. FBNN employ a complex network of trucks, drivers and schedules to deliver USDA commodities, shelf-stable food orders and perishable foods to partner agencies and directly to clients around FBNN 21-county service area. Some of that network consists of donated space on trucks belonging to other organizations (e.g., US Foodservice). Some of FBNN partner agencies contribute transportation with refrigerated trucks, which they (and USDA-Rural Development) helped procure through grants. By far the largest percentage is via a fleet of refrigerated Food Bank box trucks, cargo vans and tractor-trailers (13 in all). Overall, the Food Bank distributed more than 10 million pounds of product from their warehouse last year.

The Opportunity:

The Food Bank's fleet of refrigerated trucks travels into surrounding rural areas (e.g., Fallon, Silver Springs, Minden, Hawthorne, Dayton, Winnemucca, Gerlach, Imlay...) to deliver food and returns to the McCarran, NV facility empty; whereas the biggest issue rural farmers say they face is getting their produce from their rural farms to the city. This effort on the part of the farmers, when undertaken, takes away from productive time on the farm, costs the farmers in fuel and can rarely be accomplished via a refrigerated vehicle (causing increased opportunity for spoilage). FPNN hypothesized there was an opportunity for Food Bank trucks to bring local farm produce safely and efficiently to market. An economical transport solution that simultaneously improves product quality (refrigerated transport) will increase the competitiveness of these specialty crops in the marketplace.

A number of excellent resources had recently come into being just prior to the project with the potential for a role to play in this opportunity:

The most visible and determined customer of locally grown produce in northern Nevada, the Great Basin Food Co-op in Reno, expanded into a much larger location in February 2012 and subsequently launched a storage and distribution center (hub) for locally grown produce – the DROPP (Distribution of Regional and Organic Produce and Products).

A North Tahoe Business Association's Leadership Program project was researching the feasibility of a Tahoe-based food hub. (The Tahoe Food Hub now exists and was recently awarded a Local Food Promotion Program grant to expand.)

The Food Bank had recently taken possession of a new grant-funded tractor and 53-foot refrigerated trailer (that meets emission requirements for both NV and CA). The Food Bank's (now five)-year-old warehouse, 18 miles east of Reno/Sparks, is equipped with a 2,280 square-foot/138-pallet refrigerated room, as well as a huge freezer and a 66-pallet temperature-controlled room – all currently with space to spare.

Fuel cost considerations for farmers and a growing interest in local food/known-your-farmer-and-your-food (increased demand) cannot be overlooked as important factors.

The Food Bank contracted a professional logistics consultant – ITS Logistics - to conduct a feasibility study to determine the logistics that would be required to match the resource of deadheading Food Bank trucks to the needs of small rural farms and at least one key distribution center (DROPP) to safely and efficiently move locally grown produce from rural northern Nevada to the Reno/Sparks urban marketplace.

Project Approach

Executive Summary: The Food Bank retained the services of ITS Logistics to frame relevant logistical issues related to this opportunity. The specific items the consultant was tasked with and completed were:

- Defining the overlap/match between produce distribution needs of rural farmers and distribution requirements of Food Bank programs/vehicles.
- Calculating the economics of leveraging Food Bank trucks to backhaul produce, including:
 - Demand
 - Incremental Costs (e.g., those associated with labor, running truck refer units on return trips, software development, product storage, additional insurance and operating authority license, etc.)

- Pricing Options
- Operational impact challenges to achieving value with this opportunity (timing, routing, communication, food safety, impact on core Food Bank operations, etc.);
- Legal / regulatory requirements to implement the plan;
- Liability risks relevant to the opportunity, mitigation measures;
- Other significant concerns / challenges.

Specialty Crop Producer Survey – Food Bank representatives designed a farmer survey that would determine the need for and interest in the proposed transport services and help them understand what the farmers are doing today to transport their product. This survey was administered via participant packets at the Nevada Small Farm Conference in February 2013. Further participation was garnered via an online survey. In total, 34 surveys were returned out of 74 targeted farms, a statistically significant percentage (note that three of the 34 were discarded from the analysis because they did not contain enough information to be considered usable). The Food Bank and ITS analyzed the results; key insights from the survey were used to inform the rest of the study.

“This (proposed) solution is accomplished with minor but important adjustments to existing practices and processes by each of the key stakeholder groups.”

Great Basin Community Food Co-op – Concurrent with the farmer survey, the study team conducted research of the Great Basin Community Food Co-op, particularly its DROPP (Distributors of Regional and Organic Produce and Products) food hub, as one of the area’s largest purveyors of local produce/specialty crops. The ITS and Food Bank team interviewed DROPP management, toured the facility and secured a “dummy” account on the DROPP online ordering system in order to further FBNN knowledge of the operations and mechanics.

Other Distribution Possibilities – ITS researched other distribution mechanisms for local produce, including the Tahoe Regional Food Hub, CSAs, farmers’ markets and local restaurants.

Food Bank Operations Study – ITS spent extensive time studying (and the Food Bank providing) information about the Food Bank’s facility, fleet and logistics, including detailed analysis of driver and truck capacities, schedules and routes.

Report Developed – Concurrent with the above, ITS researched standards regarding fruit and vegetable packaging, storage and transport best practices, insurance requirements and a myriad of other details required to complete the study. All of this information was analyzed and packed into a 50-page feasibility study report with 94 pages of appendices. This report was delivered to the Food Bank in September 2013. In late November 2013, the Food Bank provided detailed feedback and questions in writing to ITS on the draft report.

“The most important takeaway from the survey results was that 16 of the 31 respondents expressed moderate to high interest in becoming an active participant in the project.”

Activities Performed in 2014

ITS responded to the edits and questions on the draft report submitted to them by the Food Bank and presented report highlights to the Food Bank on January 10, 2014, answering remaining Food Bank questions.

Project Activity	Who's Responsible	Original Timeline	Revised Timeline
Present findings to stakeholders	Logistics consultant/firm	June 2013	January 2014

The meeting at which the consultant presented findings to the Food Bank team was Friday, January 10, 2014. ITS also provided the study report in an electronic format to make sharing results more feasible. The Food Bank delivered bound printed copies of the entire report to the NV Department of Agriculture and the Great Basin Community Food Co-op.

Though not required in the grant, the Food Bank shared a very short summary report with attendees of the 2014 Nevada Small Farm Conference in February 2014 and with attendees of the Co-op's Love Your Farmer Dinner in June 2014 (attached).

Goals and Outcomes Achieved

Completion of a survey (and corresponding report) of northern Nevada specialty crop farmers, covering their foreseeable need for refrigerated transportation of product to Reno/Sparks (or specifically the DROPP), including timing, quantities, storage boundaries, ability to meet Food Bank trucks in nearby/regional locations, etc. Review of Great Basin Community Food Co-op DROPP structure, schedules and future plans, as well as other distribution options. Analysis of Food Bank programmatic distribution requirements, fleet composition and driver capabilities (CDL licenses, etc.), as they relate to farmer needs and DROPP scheduling requirements.

Preparation of a written report characterizing the opportunity and preferred alternative – the extent of the fit between the needs and resources, alternatives for how the service can work (including all logistics, food safety measures, liability and regulatory considerations, changes to schedules, cost/pricing approach, etc.), resources that would need to be secured, other mitigation measures, and a discussion of remaining concerns and challenges.

Beneficiaries

In addition to the Food Bank of Northern Nevada, beneficiaries of the Farm-to-Hub Feasibility Study included regional farmers and the Great Basin Community Food Co-op and its customers.

Regional Farmers: The completion of this project brought to light the feasibility of transporting rural farmer produce by the Food Bank fleet to market in Reno. As a result of the Study the Food Bank has decided to implement this program as a pilot in 2015. Regional farmers will now have the opportunity to save time and money by sending their product to market in trucks, as well as the ability to access the larger market in Reno, which they may have not been able to do previously.

The Great Basin Community Food Co-op (GBCFC) and its customers: As a result of the completion on this project the GBCFC will now be able to provide more local produce to their customers, partner with the Food Bank, support local farmers and work to strengthen the regional food system.

Lessons Learned

The entire Farm-to-Hub Feasibility Study was a lesson learned. As a result of the Study FBNN did in fact determine the logistics that would be required to match the resource of deadheading Food Bank trucks to the need of small rural farms and at least one key distribution center (DROPP) to move locally grown produce from the rural areas to urban markets. Not only did FBNN determine the logistics but they discovered that this service is feasible and are moving toward implementation a program pilot in 2015.

Local Producers:

The issue that many small, rural farmers face is that their crops yield small sellable quantities throughout harvest season and their farms reside in rural locations. In order to realize the best sales prices, rural farmers must reach consumers in the urban markets of Reno and Sparks. However, frequently transporting small harvest yields to urban markets means increased fuel and vehicle maintenance costs plus lost productivity time incurred to drive into the Reno/Sparks area and back.

The Farmer Survey produced some key insights regarding the behavior pattern of the farmers as well as their concerns surrounding the proposed program. The most important takeaway from the survey results were that 16 of the 31 respondents expressed moderate to high interest in becoming an active participant in the project. This means that over 50% of the surveyed group would at least be interested in the results of this study and how this program could potentially help them in the future. Almost all of the interested respondents said they would either start doing business in the Reno/Sparks area or increase the amount of business done in the area today. Of the remaining 15 respondents, 10 indicated they were neutral regarding the project and 5 were not interested.

Many of these farmers are required to travel extensively in order to sell their produce, and a significant portion of this group places a premium value with the connection they have with the buyer of their produce. Above all, if farmers are going to participate in the program they need to be confident their product is in good hands.

The survey showed farmers make 2.77 deliveries per week during peak production times and are on average 23 miles away from their primary market location. We can therefore estimate that the roundtrip drive time required would be at least 1 hour per delivery and consume almost 3 hours per week. This means farmers spend a considerable amount of time performing this task during the busiest time of their year. The survey showed that the median cost for farmers to make a single delivery is \$30. These factors help explain why 45% of the farmers listed the town in which they reside as their primary market. Rural farmers in the Northern Nevada food shed are on average over 60 miles away from the Reno/Sparks area. The cost and time involved to make deliveries likely accounts for why over 70% of the farmers surveyed listed a location other than Reno or Sparks as their primary market. Based on this information we can conclude that transportation is at least a contributing factor for why more rural farmers do not sell more of their produce in the Reno/Sparks area.

Great Basin Community Food Co-op/DROPP Program practices/logistics:

The Co-op is likely to be the biggest single purchaser of produce from the rural farmers targeted in this study as a result of their newly launched Distributors of Regional and Organic Produce and Products (DROPP) program. The DROPP program is Northern Nevada's only online wholesale ordering website for organic, local food. The DROPP program facilitates business-to-business e-commerce between regional buyers and sellers of organic and sustainably produced food. It allows buyers, which today consist of the Co-op and several local restaurants, to connect and purchase from small, local farmers, and it provides farmers a viable outlet by which to sell their crops. The Co-op's facility serves as the physical order fulfillment and payment transaction point for the DROPP program. Farmers are responsible today for delivering product to the Co-op.

Food Bank of Northern Nevada Capacity and Logistics:

The Food Bank's private fleet consists of 4 temperature-controlled semi-trailers ranging from 28 to 53 feet in length. These trailers are towed by 3 semi tractors, each with a GVWR max of 80,000 lbs. These tractors must be operated by drivers holding an active Class A CDL. The private fleet also includes 8 temperature-controlled box trucks, 3 of which have a GVWR over 26,001 lbs. and require a Class B CDL for operation and 6 that require Class C license. The Food Bank uses the 60/70 hour on-duty limit rule for scheduling all driver work time. This rule stipulates that a driver may not drive after 60/70 hours on duty in 7/8 consecutive days. ITS Logistics used the Food Bank's program distribution schedules for its Mobile Pantry, Commodity Supplemental Food Program (CSFP), and Core Food Program using Parking Lot Distribution (PLD) operations to model each program's routing schedule and the amount of time drivers spend on-duty each week. These models show that each of the current schedules could support increasing the amount of time drivers spend on-duty without exceeding the hours-of-service limitations.

ITS Logistics concluded that capacity exists in the Food Bank's distribution network to handle inbound freight (local specialty crops, in this instance) back to the Food Bank Distribution Center (DC). The only additional transportation cost would be the drivers' time to process receipt of the cargo and the operation of the trailers' refrigeration unit. This is assuming the inbound freight being carried is consigned to the Food Bank warehouse on pick-up day, and no additional miles are required to complete the delivery of this freight. ITS also concluded that capacity exists in the Food Bank's distribution network to handle outbound freight (delivery of farm products to the DROPP food hub) via trucks now travelling empty to the Reno/Sparks area daily.

Proposed Solution:

This study has concluded that a solution exists that would provide a low-cost transportation option to rural farmers seeking to sell their produce in the urban markets of Reno and Sparks by using the Food Bank's temperature-controlled trucks. This Proposal requires all key stakeholder groups – Food Bank of Northern Nevada, Great Basin Community Food Co-op, and the farmers of northern Nevada to participate at the level specified. Without complete participation by all three parties, the likelihood for this project to be successful is questionable.

Basic solution proposed by ITS:

Farmers would be required to use the DROPP food hub and would place requests for Food Bank specialty crop/order pick-ups via a revised DROPP website.

Farmers would deliver produce to Food Bank drivers/trucks at nearby regularly scheduled rural food distribution locations – immediately following the distribution. Drivers would accept properly packaged orders and load them onto the trucks. Produce would be brought that day to the Food Bank warehouse/cold storage via refrigerated truck.

Outbound Food Bank trucks on subsequent days would deliver the produce to the DROPP for customer pick-up or customer-arranged local delivery.

Payment – ITS has proposed various cost-recovery models that represent transportation charges to farmers.

There are a number of dependencies upon which this proposal is based, including (but not limited to):

- Farmers would be required to use the DROPP food hub. It is important to note that many of the farmers do not use the DROPP today, and that the DROPP charges fees (20% of transaction total) to the farmer. This was identified by ITS as the most significant risk to the proposed solution.
- The DROPP would need to create new functionality within their website to incorporate Food Bank truck schedules, freight billing zones, ability to choose the Food Bank as a transport option, pick-up scheduling, transmittal of pick-up request to the Food Bank and possible freight billing capacity (\$4000 estimated).
- The Food Bank would need to obtain Motor Common Carrier of Property (except Household Goods) Inter-state Operating Authority (\$300) and proof of both public liability (bodily injury and property damage – BI & PD) and cargo insurance (\$2500?).
- The Food Bank would be required to significantly change the way drivers work today and would be required to provide an additional investment in training for drivers.
- Timing fit – Food Bank trucks are in some rural areas only once or twice per month. This would present a challenge to farmers in the area in terms of timing crop readiness for transport.

Contact Person

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Farm-to-Hub Transportation Study

Using the Food Bank's refrigerated trucks to transport rural farm products to the Reno/Sparks market

Background: In 2013, the Food Bank of Northern Nevada conducted a study to determine the feasibility of having our refrigerated trucks backhaul small rural farm products to the Reno/Sparks market. The decision to look into this opportunity was based on hearing from rural farmers that transportation can be a barrier to success. The motivation for the study was to build our local food system by promoting the viability of these farms. With grant funding from a USDA Specialty Crop Block Grant through the Nevada Department of Agriculture, the Food Bank retained the services of ITS Logistics, a Nevada-based transportation and distribution services provider, to analyze data collected from local farmers, the Food Bank operations team and the Great Basin Community Food Co-op. The goal of the project was to determine if a business fit exists between the logistical operations of the Food Bank, the needs of local farmers and demand from the urban marketplace.



Results: The feasibility study determined that a solution does exist that would provide a low-cost transportation option for rural farmers to send produce to the Great Basin Community Food Co-op's Regional Food Hub (DROPP) via Food Bank temperature-controlled trucks. This solution will require all key stakeholders – farmers, Food Bank and Co-op – to make some adjustments to their normal business practices and to work in a tightly coordinated manner.

How it would work:

- The Food Bank posts its truck schedules on the Co-op's Food Hub website.
- Using this website, farmers post their products for sale and when sold, place requests for the Food Bank delivery option.
- Farmers deliver products to a nearby Food Bank regularly scheduled rural food distribution location – immediately following the distribution/unloading of charitable food delivery. Food Bank drivers accept and load properly packaged orders onto the truck.
- Food Bank transports products that day to the Food Bank warehouse/cold storage via refrigerated truck.
- Outbound Food Bank trucks on subsequent days deliver the products to the Co-op for customer pick-up.
- Farmers get billed via the Co-op for the delivery service, which is then reimbursed to the Food Bank.

Benefits:

- Affordable transport alternative for rural farmers
- Farmers spend more time growing great food and less time driving
- Rural farmers gain increased access to urban markets/customers
- Increased food safety, freshness and reduced product loss due to in-transit refrigeration
- Consumers benefit from greater access to local food
- The Co-op has more local farm products to sell
- Increased farmer options / viability = More robust local food system!

Considerations:

- Farmers will need to sell their products through the Co-op's Regional Food Hub. (For more information about the Great Basin Community Food Co-op's Regional Food Hub please visit, <http://www.dropp.coop>)
- Farmers will need to deliver products to a nearby Food Bank of Northern Nevada distribution location. For example, if you are a farmer in Fallon you would bring your products to the old Pepsi warehouse (off of Taylor Place behind the Walmart). Locations and times will be posted on the Co-op's website.
- Timing fit – Food Bank trucks are in some rural areas only once or twice per month, while in others multiple times per week.

Tell me about the Great Basin Co-op and their Regional Food Hub

- The Great Basin Community Food Co-op may be the biggest single purchaser of products from the region's rural farmers. The Co-op's Food Hub aggregates and sells products to customers from their Downtown Reno location. The Co-op's Food Hub is northern Nevada's only online wholesale ordering website for organic, local food.
- The Food Hub facilitates business-to-business e-commerce between regional buyers and sellers of organic and sustainably produced food.
- It allows buyers, which today consist of the Co-op's retail storefront, wholesale buyers and local restaurants and caterers, to connect with and purchase from local farmers, and it provides farmers a viable outlet through which to sell their products.



Tell me about the Food Bank

- The Food Bank's fleet of refrigerated trucks includes 4 temperature-controlled semi-trailers ranging from 28 to 53 feet in length and 8 box trucks.
- The Food Bank serves over 90,000 square miles of northern Nevada and California. We truck fruits and vegetables, commodities and non-perishable foods to schools, senior centers, food pantries and other partner agencies.
- After deliveries, Food Bank trucks today return to the Food bank regional distribution center empty.
- The Food Bank's warehouse is equipped with 7,380 square feet of cold storage space.



Beginning this spring (targeted for May/June, 2014) the Food Bank will be launching a pilot of our Farm-to-Hub transportation project. We are seeking interested growers in the Fallon area wanting to expand their market and/or needing an alternative transport option.

If you are interested or need any additional information please contact:

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Project Title

Farmers Assistance Program

Project Summary

The project aims to increase food safety knowledge and improve safe handling practices in Nevada. The project goals were to help producers gain a competitive advantage in marketing and distribution by improving farm practices as a result of Good Agriculture Practices (GAP) trainings and technical assistance. At the start of the award there were only two Nevada producers GAP certified through USDA. USDA Auditors were traveling from California to perform Nevada GAP audits since no auditors were licensed in Nevada. In addition, there was no on-farm food safety training programs available in Nevada, hindering farmer's ability to enter larger markets.

At the start of the project NDA was only familiar with four operations that had an active food safety program in place out of an estimated 127-140 producers registered with NDA. Many retailers, wholesalers, and distributors require a food safety program in order to purchase produce from a farmer. The project's aim is to increase the number of farmers receiving training on GAPs and becoming certified in Nevada. An additional goal was to take proactive steps for preparing Nevada growers for the Food Safety Modernization Act, Product Safety Rule. Long-term the Department would be better prepared to assist farmers in various facets related to food safety allowing them to minimize liability risks, broaden sales avenues, and market their farm food safety program.

To further encourage producers to participate in a GAP audit, the project included funding for reimbursing operation's audit costs. Audit expenses eligible for reimbursement included audit fees, water testing, soil testing, etc. This incentive created opportunity for small operations to receive certification that otherwise may not have been able to justify the costs.

Project Approach

The first critical steps needed to initiate the project were to send NDA staff to be trained by USDA on the GAP Auditor Program. In December of 2012, two staff attended USDA GAP training in Fredericksburg. Staff received a week long training to start the processes of becoming licensed to become GAP auditors. The USDA regional office and the NDA office determined after learning more about the certification process that certifying one inspector and training one supervisor would best serve Nevada's needs. By October 2013, one employee was licensed to perform GAP audits and their supervisor was trained on the program.

NDA partnered with the University of Nevada Cooperative Extension (UNCE) office to coordinate a series of trainings that would increase producer's knowledge on GAPs and the audit process. Throughout the grant three trainings were provided in Northern Nevada and two were provided in Southern Nevada with additional trainings provided at individual farms. NDA staff participated on the Small Farms Conference (SFC) planning committee in order to provide GAP information at an event that caters to the majority of Nevada's specialty crop growers. Growers were notified of trainings available through email, phone, fliers, and press releases.

The Cost Share Assistance program was highlighted at the GAP trainings in order to encourage participation in the program and to assist operations that were interested but were unable to cover the costs. In addition, a brochure was created highlighting the program and was provided at several Nevada agriculture service offices and during trainings performed throughout the grant. In addition, several educational resources including a website, flyers, and PowerPoint presentations were made available to interested growers.

Goals and Outcomes Achieved

Goal 1: *Increase farmer participation in GHP/GAP from 2 to 15 by 2015, in 2013 increase participation by 10% and 20% by December 2014. Performance Measure: number of participants that have requested program services.*

In the first year of the project 2 GAP audits and two mock audits were performed. During the second year of the project four initial GAP audits and three unannounced audits were performed. By the third year of the project there were still only four initial GAP audits and four unannounced audits, however several operations that had attended GAP trainings began to develop food safety programs. In addition, two out of the four GAP certified operations indicated that they would be unable to pursue GAP certification without the cost share program. Although the goal of certifying 15-30 farmers was not achieved, an estimated 15 operations have created food safety programs throughout the grant, allowing them to enter markets that require a food safety plan but does not require the certification. All 15 of these operations received training on GAPs and received technical assistance from project staff. In addition, three mock audits were performed in order to encourage more participation and technical assistance. The operations that became GAP certified, created a food safety program, or that received a mock audit will also be better prepared for the Produce Safety Rule requirements.

Challenges have been experienced in getting more farms GAP certified since the majority of crop sales consist of direct sales and the retailers that farmers are most interested in selling to, do not currently require a food safety verification program. This is anticipated to change as food safety is appearing more on the radar of buyers and consumers, particularly with the Food Safety Modernization Act, Produce Safety Rule finalization approaching.

Staff have worked with UNCE to educate growers on GAPs, the audit process, the cost share program, and the benefits of marketing products as sourced from a GAP certified farm. During UNCE trainings, the Great Basin Food Collaborative (sells produce for most of the specialty crop growers in Northern Nevada) presented and indicated that operations that are GAP certified or have a food safety program will have this information included on the DROPP website. This will allow restaurants, wholesale, retail, and individual buyers to identify whether farms have a food safety program and is anticipated to shift buyer preferences towards farms with a food safety program.

Goal 2: *Increase food safety knowledge and awareness of Nevada Producers statewide. Performance Measure: Number of participants in workshops, roundtables, and symposiums through sign-up sheets.*

Beginning in January of 2013, NDA partnered with UNCE to pilot an educational GAP program. As a result, five GAP trainings have been held since the start of the project. Three were held in

Northern Nevada and two were held in Las Vegas. Seventy attended trainings in the north and thirty-five participants attended in the south. The newly trained GAP auditor spoke at all trainings familiarizing potential participants with the USDA checklist and the Farmers Assistance Program.

To increase awareness of the GAP program and available trainings, a GAP presentation was provided at the 2013 and 2014 Small Farms Conferences (SFC). The presentation included an *Introduction to GAPs* (provided by UNCE), and *What to Expect from a GAP Audit* (provided by NDA). Presentations explained the GAP certification process, how to develop a plan for small farms, and the benefits of being GAP certified in terms of liability and marketing. The farmers Assistance program was also introduced at both conferences. At the end of the 2013 session, thirteen evaluations were received. 54% of the participants indicated that they would use the information right away, 23% said within 3 months, 15% indicated they would use it within 6 months, and 8% indicated they would use the information within a year.

Thirty-two individuals were present at the 2014 Small Farms Conference GAP sessions. Survey results from the 2014 conference *Introduction to GAPs* session including the following: 44% of the 20 evaluations received indicated that they would use the information right away, 28% within 3 months, 11% within 6 months, 6% within 1 year, and 11% within 2 years. Survey results from *What to Expect from a GAP Audit*, out of 9 evaluations received including the following: 33% indicated they would use the information right away, 16% within 3 months, 17% within 6 months, 17% within 1 year, and 17% within 2 years. Trainings were coordinated through this project and in conjunction with a Farm to School Grant award that ended November 2014. The Farm to School Grant project was geared at creating a farm to school food safety program in Nevada. Both grants complemented each other in creating a food safety program specific to farmers and for school gardens/farm to school.

Throughout the grant approximately 150 individuals were educated on GAP. Five GAP workshops were conducted and presentations were provided at the 2013 and 2014 Small Farms Conference. In addition, three GAP mock audits were performed, however two of the mock audits were performed on different scopes for the same operation. The two operations that received mock audits became GAP certified and four out of the five developed a food safety program.

A webpage was developed which included resources and forms for those wishing to participate in the program. A brochure was also developed and is handed out to cooperating agencies and other offices for distribution. Forms were developed for the program as well as procedures on how audit activities would be performed and how cost share payments would be distributed. An overview of the program and full application were completed and added to the website <http://agri.nv.gov/GAP/>.

In order to encourage more participation, staff will continue collaborate with UNCE with the following: coordinating trainings on food safety practices and the GAP certification process, providing GAP field assessments, and in performing outreach at specialty crop stakeholder events through the 12-25-B-1683 SCBGP award (which builds upon this project).

Goal 3: *Improve the competitiveness of specialty crop producers who become GAP/GHP certified. Performance Measure: Number of producers who became certified that have expanded/increased access to distribution outlet/sales that were not accessible before becoming certified. Collect data through surveys and evaluations of the program.*

To date four farms have become certified. Of those four farms, two are new to the GAP program. In addition, two of the certified operations have expanded their specialty crop production into hoop houses and are in the process of developing a GAP program for the new property. Becoming GAP certified has allowed certified operations to sell specialty crops to local retailers (including Raley's), Casinos (Peppermill), Institutions (University of Nevada), and large distributors (US Foods, Bonanza) that otherwise would not have been available to them. One of the operation that became GAP certified during the project, High Desert Farming Initiative (HDFI), has taken the initiative to present at several trainings on the benefits of GAP certification and how this has allowed them to enter new markets. To assist interested farms in becoming GAP certified HDFI has posted their food safety model on the internet <http://highdesertfarming.org/gap/> and has volunteered their operation for group field assessments. Project staff arranged for them to speak at the 2015 small farms conference on why a food safety program is important, how it can be used as a marketing tool, and how it has helped them enter new/larger markets.

Twelve Farmers Assistance Cost Share requests were received for operations successful at receiving GAP certification. An additional three are anticipated to be requested from September 2015 under the new Farmers Assistance Program Management project under 12-25-B-1683.

Beneficiaries

The 150 individuals that participated in the trainings throughout the grant are the significant beneficiaries of the project. They were able to increase their knowledge on best practices for minimizing food safety risks on the farm, and on resources available to assist them in creating a farm food safety program. In addition, the 15 farms that created food safety programs benefitted by taking advantage of the services offered through this grant program and will have an increased potential of selling thru markets that require a food safety program. The four operations that participated in the cost share benefitted by receiving financial assistance that offsets their GAP certification costs, allowing them to sell to large retailers, distributors, etc. In addition, consumers of Nevada products benefitted by the changes farmers implemented on their farms to minimize food safety risks to the local food system.

Lessons Learned

The auditor certification process took more time than anticipated, so NDA was not able to perform as many audits in 2013 as initially anticipated. Though the certification process took longer, the job and field training was extremely valuable and has provided a beneficial resource for produce safety.

Moving more operations towards becoming GAP certified is a continuing struggle as many buyers in Nevada still are not requiring GAP certification. Further, some buyers have allowed farmers several years to achieve the certification and many farmers in Nevada are selling directly to consumers, which does not require a food safety program. In addition, most farms in Nevada are very small and may not be able to supply the demand required to sell to a large retailer,

wholesaler, or distributor, therefore they don't see the need to invest in a food safety program since it is not required. Although at this point in time GAP certification is not being heavily required, US Foods and Whole Foods presented at the 2015 Small Farms Conference and indicated that if farms wish to sell to them, they would need to become GAP certified. This has at a minimum demonstrated to growers that food safety is an increasing demand from buyers.

Although many farmers are still selling via direct sales, they have an increased appreciation for the importance of food safety practices when selling their products. Growers have a better understanding as to how a food safety program can serve as a marketing tool and potentially limit liability. Food safety education and technical assistance has prompted an estimated 15 farms to develop food safety programs which is still a significant success in minimizing risks to the food system in Nevada.

Project staff have identified that farms are reluctant to receive GAP certification due to (a) the fear of failing the audit, (b) few to no GAP certification requirements from buyers, and (c) the initial time investment they need to dedicate to establishing policies and procedures, training staff, and implementing necessary on-farm changes. To address these issues, project staff will continue to perform outreach, coordinate trainings, and seek out resources that will help farms initiate a food safety program and comply with the FSMA rules.

Contact Person

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Project Title

Plants to Plates - Youth Horticulture Education

Project Summary

The objective of "Plants to Plates" was to provide high school-age youth with an educational experience in horticulture that included hands-on participation in growing food and business practices in the food system.

The project resulted in:

- (1) Establishment of a partnership between the university, a high school, a youth organization, and a local restaurant;
- (2) Development and testing of informal educational curriculum materials;
- (3) Production of two seasons (spring and winter) of specialty crops to supply a local restaurant; and
- (4) Collection of data and information that informed the creation of a sustainable business plan for future program operations.

The project enhanced the competitiveness of Nevada Specialty Crops by creating a model and informing a business plan for urban community educational programs to grow specialty produce that restaurants can purchase. This pilot effort enabled the project team to collect planning, logistic, and pricing/budgetary projection data that demonstrated the feasibility of high schools growing produce to sell to local restaurants.

The effort did not include any non-specialty crops, and was not funded previously by this or any other Federal or State grant program. Program income was not generated during the project.

Project Approach

Part 1 of the project encompassed partnership formalization, curriculum material design, and assessment tool development. Educational materials were prepared on the various aspects of plant sciences to support produce distribution and continued program operations. The focus of **Part 2** was implementing the education and planning phase. Students attended workshops and received direct instruction about horticulture and agriculture. **Part 3** included the installation of the raised beds and hoop houses, followed by the planting of crops. Regular plant care and maintenance occurred until plants were ready for harvest. **Part 4** of the project was the evaluation component of the program.

Further details on the results, accomplishments and significant contribution of partners are contained in the following section. Conclusions drawn from this project are as follows:
A partnership between a school district, restaurant, and university can be successfully developed. Participation in a high school gardening project provides opportunities for students to learn about gardening and finances and to feel motivated to learn more about gardening.

One strong recommendation emerged from the results from this project. Based on the favorable reports of the students, it is recommended that continued support be provided to school districts to incorporate garden projects into their curriculum in an interdisciplinary manner. This project involved the biology and business teachers working in partnership which moved students beyond an understanding of gardening to an appreciation of the financial complexities of farming.

The timeline for the project was as follows:

October 1, 2012-December 30, 2012

- Partnerships were formed between UNLV, Mundo Restaurant and Northwest Career and Technical Academy.
- An outline and draft of the informal education curriculum was developed.
- Garden space and irrigation options were developed.
- Dates were set for youth training sessions.

January 1, 2013 - March 28, 2013

- Students went on a field trip to the restaurant.
- Training sessions were conducted
- Students designed the raised beds.

April 1, 2013 -June 30, 2013

- Raised bed construction began.
- Irrigation meetings were held.

July 1, 2013 - September 30, 2013

- Raised bed construction was completed
- One classroom training session was conducted

October 1, 2013 - December 31, 2013

- Crops were planted and harvested
- The business teacher provided training in business plans

January 1, 2014 - June 30, 2014

- Crops were planted and harvested
- Business plan was created
- Students completed evaluation forms

Goals and Outcomes Achieved

GOAL 1: Establish a project implementation partnership among the university, a high school, a youth organization, and a local restaurant.

Mundo Restaurant and Northwest Career and Technical Academy (NWCTA) partnered with UNLV on the project. The executive chef at Mundo worked with students to determine what produce was needed by the restaurant. Teachers and students at NWCTA took responsibility for developing a business plan. The UNLV project coordinator was responsible for developing the gardening strategy. With assistance from project personnel, Candlelighters, a nonprofit organization that works with youth cancer survivors and their siblings, partnered separately with Mundo Restaurant and WorldMark (the owner of the Mundo property) so that an additional garden could be installed at the restaurant.

Twenty-eight students, the principal of the school and two biology teachers were accompanied by the UNLV project coordinators on a field trip to the restaurant on February 28, 2013. The group took a tour of the restaurant and the onsite garden space being maintained by the Candlelighters youth volunteers. During the tour the students saw the compost bins and worm buckets and discussed the importance of composting and adding nutrients to garden. The students participated in watering the worm buckets and planters before eating lunch at the restaurant.

GOAL 2: Develop and test “Plants to Plates” informal educational curriculum materials.

In early November 2012 an outline was created for the informal educational materials. A draft of the curriculum was completed by the beginning of December. The curriculum materials on seeds

were delivered to students during the spring semester 2013. A pre-assessment regarding the soils content was also administered in the spring. The materials on the "Soils of Southern Nevada", along with "pH for Garden soils" were delivered to the students in the fall 2013 semester with 30 students involved. After these sessions the students worked on irrigation systems for the beds and planted seeds, providing a kinesthetic component to the learning.

A curriculum unit on composting and mulching was developed and delivered in November. Worm buckets were created by students to begin composting. Afterwards the students spent time in the garden to check on growth of vegetables and determine watering needs. Curriculum materials continued to be developed and delivered to the students in 2014. Seventeen sessions were held in the classroom and the garden. Materials included the topics of amending soils and plant selection. Photos of the outdoor curriculum are included in the appendix. The curriculum materials included a summative survey of students' attitudes about the project. The instrument and results are included in the appendix.

GOAL 3: Expand distribution of locally grown produce to food/restaurant industry.

Garden space was surveyed, a water source was located and an irrigation plan was developed in the first year of the project. The Clark County School District grounds crew was consulted throughout this process.

During the first year of the project raised beds were planned and built. Engineering and Construction students completed CAD drawings and computed the amount of bricks needed. In addition, an irrigation system was designed and installed in the beds. This infrastructure was crucial to expanding distribution of locally grown produce. The construction work had to be done in accordance with the Clark County School District (CCSD) standards and all inspections were conducted to insure compliance.

The first crops were planted in the Fall 2013 semester. Based on the needs of the restaurant, the following produce was grown: cilantro, assorted lettuces, arugula, radish, oregano, and thyme. The beds built in the first year of the project continued to be used by students to produce food in the second year of the program. In addition to restaurant connections, the students were able to share the produce with their families. Students reported feeling proud as their families prepared dishes using the produce they had grown. Students produced four produce harvests with an average of 40 pounds each in 2014. Two of the harvests were delivered to Mundo restaurant while two of the harvests were shared with the students' families.

GOAL 4: Collect data and information with which to create a sustainable business plan for future program phases.

A field trip to the restaurant in the first year of the project included the first steps necessary to creating a sustainable business plan. Speakers George Harris and Mingo Collaso conducted a business seminar after the lunch the students enjoyed. Topics addressed included the importance of the limited liability company (LLC) structure, knowing your market and giving back to community as a business. The students also met with the chef to discuss the needs of the restaurant. The students applied the knowledge they gained from this field trip as they developed the business plan in the second year of the project. The business teacher at NWCTA became involved in the project in the second year. The teacher provided guidance to the students on

developing a sustainable business plan for the project. In the final months of the program a business plan was created by students using the data they had collected throughout the program. The plan the students created is included in the appendix.

Beneficiaries

Thirty students enrolled in the biology class at Northwest Career and Technical Academy were the primary beneficiaries of this project. While there was no immediate economic impact of the project, these students developed an interest in horticulture and an understanding of the finances involved in producing and selling food.

Lessons Learned

Building the raised beds required approval from the CCSD facilities department. Complying with CCSD standards can be a difficult path to negotiate and delays impacted this project. Initially a crop was to be planted and harvested in Spring 2013. Delays on receiving permission to build made that impossible. When approval was granted it was so late in the semester that students were unable to assist in the final completion of the raised beds. To stay on target with overall project goals, the budget was examined and then modified so that a contractor would be able to finish the beds in time to plant fall crops. The successful completion of the beds and the irrigation system is a testament to the strength of the partnership between NWCTA and UNLV. The lesson learned was that multiple partners are needed to successfully implement projects that outside the traditional school curriculum.

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Additional Information

A sample of the lesson handouts, a copy of the project evaluation instrument, results of the evaluation, photos of the outdoor component of the curriculum and the business plan developed by the students have been provided as additional information via attachments.

Plants to Plates Attachments

Attachment 1

HANDOUT 1

Introduction to Soils

Gardeners usually agree that the most important factor for having a productive garden is the **soil**. Soil is a mass of minerals, water, living organisms, and dead organic matter. It not only anchors a plant in place, but also provides the plant with most of its nutrients and moisture. Key to successfully growing a garden is using healthy, nutrient-rich soil with physical and chemical characteristics matched to the plant you wish to grow. Southern Nevada soils generally do not meet the standards required by most common vegetable plants, and therefore need some amendment with organic material to increase fertility, balance drainage, and retain moisture. If soils are poor in any respect, they can be corrected using knowledge about the needs of plants and the right tools and materials. In this lesson, we will look at soil closely, learn about its physical and chemical characteristics, and discover ways to adjust it.

Organisms and microorganisms perform the essential function of decomposing living matter and helping make nutrients available to plants. **Decomposition** is an important process in creating excellent garden bed soil. Sooner or later all living material dies and will become food for the many bacteria, fungi, insects, worms, etc., that inhabit the soil. These decomposed organic materials become nutrients for the plants, but this natural decomposition process can take many years. Gardeners assist and increase the rate of this process by **mulching** and **composting**. Organic materials may be in the form of grass clippings, hay or straw, leaves, newspapers, livestock manure, sawdust, coffee grounds, and other materials. Spreading compost materials and spraying with water can speed up decomposition. A good rule to follow for new garden beds is to spread three-to-four inches of compost over the beds and dig it into the top eight or ten inches of soil. The living decomposers in the soil will feed on these materials and increase the richness of the soil.

Soils and the characteristics of soil

Clay, Silt, Sand, and Loam

Soil is basically a mass of minerals, water, living organisms, and dead organic matter.

Size determines a soil's "name." Clay particles are the smallest, sand is the largest, and silt is in-between. Loam is a combination of all three.

Clay particles fit very close together. Therefore, clay soils have the greatest surface area-to-volume ratio of all soils, and are quite dense. Drainage through clay is slow!

Sandy soils have much larger pore spaces than clay; therefore, they have large spaces for air and water. They drain rather quickly. Surface area-to-volume is much less than clay. Plants in sandy soil must be watered and fertilized much more often.

Loam is a mixture of all soil types, has abundant organic material, and drains better than those mentioned above. In most cases, it is ideal for gardening!

pH

A measure of pH reflects the acidity or alkalinity of soil.

Acid soils (pH of 6.9 or lower) are most common where there is abundant rainfall. Low pH can be associated with sandy soils or those high in organic material. Most plants can grow in *mildly* acid soils, but acid soils are infertile (and not able to support crop-plant growth). In the western

U.S., acid soils can be found in western Oregon, Washington State and along California's northern coast.

Alkaline soils (pH 7.1 and higher) are more common in areas of light rainfall. They are often high in mineral content (especially CaCO_3 and Na). Soils that are slightly alkaline usually support the growth of many types of plants.

The use of "raised beds" is helpful where soils are too acidic or alkaline.

Refer to the chart: *Optimum pH Ranges for Plants*.

Organic Soil Additives

Organic material improves aeration and drainage.

It is important to improve the drainage of clay soils (which drain poorly).

In sandy soils, organic material helps to hold water and nutrients for a longer time.

As organic material decomposes, it releases nutrients, which increases fertility.

Nitrogen (N) is a very important element for plant growth. Decaying organic material releases nitrogen. But, the element nitrogen cannot be immediately used by plants. Microbes must first change the nitrogen into ammonia, then into nitrites, and eventually to nitrates, which can be absorbed by roots.

Microbes need certain things in order to live and grow. Soil additives help to improve aeration and water penetration and, in turn, improve the living conditions for the microbes.

Even the very best of soils can benefit from soil additives. Examples of some additives are peat moss, wood shavings, manure, bark, sawdust, and compost.

When organic materials are added, they should be mixed deeply into the soil. The mixing will also add some air to the soil.

Frequent and prolonged use of organic materials can lower the pH of some soils. It can be important to do a yearly soil test for pH to determine if there is a problem.

Inorganic Soil Additives

It can be useful to add inorganic material to garden soils. Physical additives include pumice, vermiculite, and perlite. These materials can improve the water-carrying capacity and nutrient retention of sandy soils, and they can improve the texture of clay soils. Chemical additives may also be needed for some soils. Some examples are lime or gypsum, which are used to raise the pH of overly acid soils.

Fertilizers

To grow and remain healthy, plants need a supply of nutrients to help in carrying out important biological processes. Three nutrients are of major importance: Nitrogen (N), Phosphorus (P), and Potassium (K). Most plants need these three nutrients for continued good growth, thus these three are the main ingredients of most commercial fertilizers. The information below describes the function of these three nutrients, along with "trace elements" that are needed only in very small amounts.

Nitrogen (N) – This is the most important of the three major nutrients. N is found in organic materials, air, and in fertilizers. Most N comes from the decay of organic materials, but some is deposited as rain falls through the atmosphere. Also, certain nitrogen-fixing bacteria that are found on the roots of legumes may extract N from the air in soil. Plants use large amounts of N to produce proteins and chlorophyll, as well as important enzymes. Adequate N is also essential

for healthy leaf growth. N can be taken up by plants only in the form of nitrate. Thus, N can be lost by the leaching action of irrigation or rain. Therefore, most soils need additions of N from time to time to insure optimum growth.

Phosphorus (P) – This element does not dissolve for roots to absorb and phosphorus-containing soils may release it slowly. As root tips grow, they absorb P from the soil solution. If the concentration of P in the soil is too low, plant growth may be stunted. Spreading phosphorus-containing compounds directly onto the soil surface is not very effective. The best way is to put it where roots can get to it. P deficiency can result in slower plant growth and poor production of flowers and fruit.

Potassium (K) – The “third number” on a fertilizer label is that of K. Most plants remove more K from soils than any other nutrient except for N and calcium. K is effective only if placed near the roots of plants. K helps regulate important plant processes including photosynthesis and carbon dioxide exchange. It is also vital in the production of some proteins.

Other essential nutrients (trace elements) – Calcium (Ca), Magnesium (Mg), Sulfur (S), and Iron (Fe) are also needed by plants, but usually in very small amounts. Ca helps with proper cellular growth, Mg and Fe help to build chlorophyll molecules, and S helps in making new protoplasm for plant cells.

Problems and Issues

Salinity – An abundance of salts in any soil is usually a problem, especially so in parts of the West where we find little rainfall and lots of desert areas. The salts can be found naturally in the soil or may result from water that is high in sodium (Na) content. Much of the salt can come from fertilizers and manures. High salt content in soils may affect germination of seeds or stunt the growth of plants.

Chlorosis – This issue is usually caused by a lack of iron. It may be suspected if leaves turn yellow.

Shallow soil – The most common physical problem of soils is drainage, and shallow soil is a major cause of poor drainage. Shallow soils are often referred to as “hardpan.” A very tight, non-draining soil is often found in the Southwest United States and is common in Southern Nevada. The most common hardpan is “caliche.” Roots cannot penetrate this hard layer, and water cannot easily drain through it. When confronted with caliche or any hardpan, it may be best to use raised beds for garden plants.

Moisture

Water...How deep?.How much?

“How much water should I use?” is probably the most frequently asked question by gardeners. It can be a difficult question to answer. According to many seasoned gardeners, the best advice might be: Water thoroughly and infrequently.

Most plant roots need water for growth. With the exception of very shallow-rooted plants, roots will grow deeper if water is available at a deeper depth. Shallow watering tends to keep roots

near the surface of the soil. It is, therefore, important to provide water to the entire root zone of plants.

To provide a healthy air-to-water ratio for plant roots, a garden should not be watered constantly. A garden should be watered deeply, but not too often. When too much water surrounds roots, they will die. Weather often determines just how much to water. Temperature, wind, humidity, as well as the length of daylight, should influence any watering schedule. In the event of a hot, dry wind, plants will lose water much more quickly. With cooler air and humidity, watering should be done less frequently.

By adding organic matter, especially compost, one can increase the soil's ability to hold water. Compost can hold five to six times its weight of water. Organic matter also provides food for soil organisms, which in turn improve soil quality and increase its ability to store moisture. With the hot and dry climate of Southern Nevada, evaporation can be a problem. Evaporation cannot be completely stopped, but it can be slowed by using mulch. A layer of grass clippings or straw will help retain moisture in the soil underneath. It can also help control weeds, as it decreases the sunlight at the soil surface.

Generally, gardeners go by one basic rule: If the top 3-4 inches of soil are dry, the plants probably need water.

Plants to Plates ATTACHMENT 2

HANDOUT 2

Garden Vegetables

Knowing **when** to plant the different kinds of vegetables in Southern Nevada is very important to their growth and production. Planting schedules for our area have been developed by University of Nevada Cooperative Extension. Additionally, planting information can usually be found at local nurseries. The following vegetable profiles will assist in knowing about individual varieties of plants and provide information on seed planting, transplanting, growing, watering, and harvesting.

Arugula: Sow seeds in the garden in early spring when danger of frost is over. Germination takes 5-7 days at a soil temperature of 40-55 F, a pH of 6.0 – 7.0 and needs full sun to partial shade. Can also be germinated in pots indoors.

Beets: Sow seeds into garden in early spring when danger of frost is over. Germination takes 5-6 days at a soil temperature of 75-80 F, a pH of 6.5 – 7.5 and needs full sun for best production. Can also be germinated indoors in pots.

Broccoli : Sow seeds in garden in early spring or transplant seedlings. Germination takes 6-7 days at a soil temperature of 75-80 F, a pH of 6.5 – 7.5 and needs full sun for best yield.

Carrots: Sow seeds into garden in spring after danger of frost is over. Germination takes 6-7 days at soil temperature of 70-75 F, a pH of 5.5 – 6.5 and needs full sun for best yield. Not recommended to germinate indoors in pots.

Cauliflower: Sow seeds into garden in spring. Not affected by frost. Germination takes 6-8 days at soil temperature of 70-80 F, a pH of 6.5 – 7.5 and needs full sun for best yield. Seeds can be germinated indoors.

Celery: Seeds should be germinated indoors during winter months or very early spring. Germination takes 7-8 days at soil temperature of 70 F, a pH of 6.0 – 7.0 and needs full sun for best yield.

Chard: Sow seeds into garden in early spring after danger of frost is over. Germination takes 7-10 days at soil temperature of 60-70 F, a pH of 6.5 - 7.5 and needs full sun to partial shade. Seeds can be germinated indoors in pots.

Cucumber: Sow seeds into garden when nights remain above 50 F or start indoors in pots. Germination takes 3-4 days and is best at soil temperature of 80-90 F, at a pH range of 6.0 – 7.0 and needs full sun for best yield.

Eggplant: Start seeds early indoors and be ready to transplant when nights remain above 50 F. Germination takes place in 7-8 days at soil temperature of 75-85 F, at a pH range of 5.5 – 7.0 and needs full sun for best yield.

Garlic: Cloves should be planted outdoors in spring or summer with the “pointed end” up. No germination, as plant grows from clove. Soil pH should be 6.0 – 7.0 and needs full sun for best yield.

Kale: Sow seeds into garden in early spring or start indoors in pots and transplant later. Germination takes 5-7 days at soil temperature above 60 F, at a pH of 6.0 – 7.0 and needs full sun, but will tolerate partial shade.

Lettuce (or Mesclun): Sow seeds into garden in early spring after danger of frost is over or start indoors in pots. Germination takes 7-14 days at soil temperature of 50-60 F, at a pH range of 6.5 – 7.0 and needs full sun, but will tolerate partial shade. Mesclun is not just one specific vegetable, but really is an entire salad. ☺

A packet of Mesclun includes seeds of a variety of lettuces and European salad greens that grow well together. (Many restaurants now offer this salad as a menu item.)

Onions: Can be grown from “sets” or seeds. Seeds should be planted indoors at least a month or more before last frost. Sets can be put out in early spring. Onions grow very slowly, so usually need a head start on the growing season. They prefer a soil pH range of 6.0 – 7.5 and soil temperatures of 60-75 F. They need full sun for best yield. What about *Scallions*? These are onion varieties that produce a bulb no larger than the width of the base of the leaves. They usually have a softer, less strong flavor than regular onion varieties.

Peppers: Whether “sweet” or “chile” peppers, these seeds should be started indoors in pots and transplanted when nights remain above 50 F. Germination takes 6-8 days at a soil temperature of 70-80 F, at a pH range of 5.5 – 7.0 and needs full sun for best yield.

Radish: Sow seeds into garden in early spring. Not recommended for germinating indoors. Germination takes 5-12 days in soil temperatures of 50-80 F, at a pH of 6.0 – 7.0. Grows best in soils of 60-65 F and needs full sun for best yields.

Summer Squash and Zucchini: Sow seeds into garden when night temperatures remain above 50 F and soil temperature is 70 F or above. Can be planted indoors in pots a few weeks before last frost and then transplanted. Germination takes 6-10 days and prefers a pH range of 6.0 – 6.5. Plants need full sun for best yield.

Tomatoes: Seeds should be started early indoors and transplanted when nights remain above 50 F. Germination takes 6-8 days in soil temperature of 75-80 F. The transplants can be made after all danger of frost is past. Tomatoes grow best in soil with a pH range of 5.8 – 7.0 and need full sun for best yields.

**Plants to Plates
ATTACHMENT 3**

Plants to Plates Garden Project Survey

This survey will focus on your opinions about the *Plants to Plates* Garden Project. For each of the statements, please indicate the level to which you agree or disagree. A “1” means you “strongly agree”, a “3” means you are uncertain, and a “5” means you strongly disagree.

Please circle one number that best reflects how you feel about the item.

	<u>SA</u>	<u>A</u>	<u>U</u>	<u>D</u>	<u>SD</u>
I think it is important to know how vegetables are grown in a garden.	1	2	3	4	5
People should know how to grow vegetables.	1	2	3	4	5
I enjoy growing vegetables in the garden.	1	2	3	4	5
The garden project was fun for me.	1	2	3	4	5
Learning how to grow vegetables is cool	1	2	3	4	5
My friends think the garden project is fun.	1	2	3	4	5
I don't mind getting my hands dirty.	1	2	3	4	5
I put effort into the garden project.	1	2	3	4	5
I have learned many things about growing vegetables in Southern Nevada.	1	2	3	4	5
I plan to learn more about gardening and growing vegetables.	1	2	3	4	5

What are the two most important things you have learned about gardening and growing vegetables?

A.

B.

Please give a grade to the *Plants to Plates* Garden Project. (A, B, C, D, or F) _____

**Plants to Plates
ATTACHMENT 4**

Plants to Plates Garden Project Survey Results

Note that results are presented as a percentage of the total responses for the item. Each row sums to 100 percent.

	<u>SA</u>	<u>A</u>	<u>U</u>	<u>D</u>	<u>SD</u>
I think it is important to know how vegetables are grown in a garden.	38	46	8	8	0
People should know how to grow vegetables.	27	42	19	12	0
I enjoy growing vegetables in the garden.	19	46	31	4	0
The garden project was fun for me.	27	38	23	8	4
Learning how to grow vegetables is cool	8	46	50	12	0
My friends think the garden project is fun.	12	15	35	23	15
I don't mind getting my hands dirty.	46	38	4	0	12
I put effort into the garden project.	38	46	4	12	0
I have learned many things about growing vegetables in Southern Nevada.	31	42	15	4	8
I plan to learn more about gardening and growing vegetables.	8	15	54	15	8

Letter grades assigned by students (26 students reporting)

- A – 50%
- B – 38.5%
- C – 11.5%
- D – 0%
- F – 0%

**Plants to Plates
ATTACHMENT 5**

Photos of Outdoor Curriculum



Plants to Plates
ATTACHMENT 6

Business Plan Developed by Students

Biotechnology NWCTA Stucco Garden Business Plan
Northwest Career and Technical Academy

8200 W. Tropical Parkway
Las Vegas, NV. 89149
Phone: 702.799.4640
Fax: 702.799.4644

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I. Executive Summary

A part of the biotechnology program, Northwest Career and Technical Academy has begun a student owned garden. The students in the biotechnology program area, as a part of their curriculum, maintain a garden, harvesting various vegetables, herbs and other plants. Biotechnology NWCTA Stucco-Garden, has a total of four beds, in addition to a greenhouse, the greenhouse is incomplete. Products from the garden are then given to restaurants to then be used in specific dishes, in which a portion of the price of the plate(s) is donated to specific charities.

Students maintain the garden in the following ways:

- Maintain the pH levels of soil in all beds of the garden
- Harvest plants
- Planting
- Upkeep of area of garden
- Researching methods pertaining to growing plants
-

Our products include various herbs, such as: rosemary, oregano and much more. Additionally, vegetables, including: lettuce, beets, and various others are grown. Student's research plants to grow during specific seasons during the school year in addition to the products the participating restaurants often use.

Owners of the garden are those of the students in a given school year in the biotechnology program area. Instructors of the program area supervise students, leading students in various projects in conjunction to the garden, such as the greenhouse. Plus, instructors from the University of Las Vegas, Nevada help guide the students in what to plant, when to harvest and providing tools for such.

In the future, if the school approves and there are restaurants willing to support the cause in helping charities, the garden will grow and expand to more beds, producing more products. Also, if there are no participating restaurants in the future, students may be able to brainstorm

ideas on what to do with the plants/products grown, making profits and donating the money to the expansion of the garden and various charities.

This is a student owned garden, so long as the administration of the school approves in addition to the instructors of the program area.

II. General Company Description

The students in the Biotechnology Program at Northwest Career and Technical Academy will be maintaining a garden throughout the school year, harvesting various vegetables, herbs, and many other plants. To provide fresh, crisp and locally grown foods of the season to participating restaurants and/or any company willing to buy at reasonable prices is the purpose of the company.

Mission Statement: Creating an effective program highlighting one of the many prospects of biotechnology, the goal of the Biotechnology NWCTA Stucco-Garden is to provide freshly grown products, sampling the seeds of various companies to discover which produces more in which will be donated to restaurants to raise funds for various charities/ foundations.

Company Goals and Objectives:

To become a part of the curriculum in the biotechnology program at NWCTA

To become a nationally renowned student owned company

To expand, doubling the number of grow boxes

To successfully use hydroponics

To provide products year round

To provide profit in order to expand more

Business Philosophy: To highlight the relativeness of biotechnology to the students of the program area, providing a hand on experience to showcase how such can apply to the world. The biotechnological industry is definitely an industry bound to grow, as in advancements and discoveries. Anything relative to the chemistry of the plant, how it responds to certain substances (soil, water, etc.) or improvements in gardening as it pertains to hydroponic or aquaponic techniques are subjects and themes the students will focus on to maximize the growth of the plants/herbs grown in the garden.

Students have accumulated much scientific knowledge in the course of their high school career, prompting seniors in the program area to apply such to garden to maximize the growth of all of the products grown. Each year, students in their senior year of biotechnology will continue on with the process of the garden. The perpetual continuation will only result in the expansion of the garden.

Legal form of ownership the Biotechnology NWCTA Stucco-Garden is a non-profit organization. All funds put into the garden are either from grants or money provided from the school specifically to fund the garden as an extension to the program area.

Products and Services

All of the products grown in the garden are not associated with any usage of chemicals or pesticides. Vegetables, herbs, and flowers grown are carefully checked upon daily by the biotechnology students. Tests recording the wellness of the soil and how a sample of soil responds to certain nutrients are done often. Such promotes the crispness, freshness and deliciousness of the products. Additionally, the students are passionate about their tending to the garden, as it not only is a part of the students' grades but to apply their knowledge of four years' worth of scientific knowledge also demonstrates how well attended the garden is.

Naturally grown herbs, vegetables, plants, etc. will be tended to throughout the entirety of the school year.

Rosemary: A delicious herb that can be used in food and drinks and available all year long. Additionally, this herb is a great source of vitamin C, iron and the vitamin B6, alleviating muscle pain, even found to promote hair growth.....(1 bunch \$1.00)

French Onions: Deliciously used in soups and as a flavoring agent in various foods, French onions are the perfect addition to add flavor to a meal. Not to mention how pretty a color the onion obtains when caramelized(1 bunch \$1.00)

Kale: With so many beneficial factors to your health, kale is a great choice to add to anyone's diet..... (1 bunch \$1.50)

Cauliflower: In our garden, we grow both purple and white cauliflower. Cauliflower is an extremely delicious vegetable, having a power to taste like mashed potatoes.....(1 bunch \$1.00)

III. Proposed Budget

The following is a list of the materials and the cost of each necessary to start the garden, a proposed budget for the project.

	Spec. Crop Funds	State	Total
Personnel Services	\$	\$	\$
(Principal Investigator/Project Administrator - .1%)		0	0
(Project Manager - 7.7%)		4,845	4,845
(Proj. Coord. & day-to-day project implementation - 25% for 7.4 months)	7,000		7,000
Fringe Benefits	700	1405	2,105
Travel			
Local Mileage (40 miles RT x \$0.555/mile x 22 trips)	489		489
Truck Rental (30 trips @ \$30.30 per trip - Lowe's)	1,000		1,000
Equipment	0		0
Supplies			
Producers Certificate (DOA)	50		50
Hoop House (2 @ \$1,080 ea - Lowe's)	2,160		2,160
Seeds (381 @ \$3 - Burpee)	1,144		1,144
Seed Start Trays (105 @ \$11 - GTG Hydroponics)	1,155		1,155
Plant Starts (17 @ \$50 per flat - Plant World)	850		850
Floriculture (4 @ \$50 per flat - Plant World)	200		200
Raised Beds (8 @ \$320 - Eartheasy.com)	2,560		2,560
Soils (Whiting Brothers Rock City, Las Vegas, NV)	1,000		1,000
Soil Amendments (Star Nursery)	976		976
Compost Tumbler (compostumbler.com)	430		430
Irrigation (Bristlecone Landscaping)	1,350		1,350
Trowels (15 @ \$10 ea - Lowe's)	150		150
Pruners (5 @ \$22 ea - Lowe's)	110		110
Rakes (2 @ \$10 es - Lowe's)	20		20
Shovels (10 @ \$10 ea - Lowe's)	100		100
Wheelbarrow (Lowe's)	90		90
Hose 50' (2 @ \$20 ea - Lowe's)	40		40
Hose 100' (Lowe's)	45		45
Hose Shower Wand (2 @ \$9 ea - Lowe's)	18		18
Hose Nozzle (2 @ \$9 ea - Lowe's)	18		18
Garden Gloves (20 @ \$7 ea - Lowe's)	140		140
Garden Journal/Notebook (30 @ \$3 ea - Target)	90		90
Educational Handouts, printing (UNLV)	493		493
Signage (various up to \$200 + shipping - Plant Signs)	200		200
Produce Twist Ties (2 @ \$17 ea + shipping - brenmarco.com)	48		48
Produce Scale (1 @ \$65 - amazon.com)	65		65
Produce Boxes (18 @ \$45 ea - AvisBag.com)	809		809
Contractual			
Mentoring (horticultural and curriculum development expertise)	1,500		1,500
Other	0		0
TOTAL COSTS:	25,000	6,250	31,250

IV. Management and Organization

The instructor of Biomedical Engineering course, also one of the program area teachers, Mr. Daryl Warren will manage the Biotechnology NWCTA Stucco-Garden, along with Ms. Stephanie Spiris. Daryl Warren comes with many years of experience in physics and radioactive material. Mr. Warren also is war veteran. Stephanie Spiris is an experienced and published scientist, specializing in biotechnology and various other core sciences. Dependent upon the approval of the NWCTA's school officials, the continuation of the garden is a decision between the biotechnology's teachers and its effectiveness to help students understand the real world application of the garden.

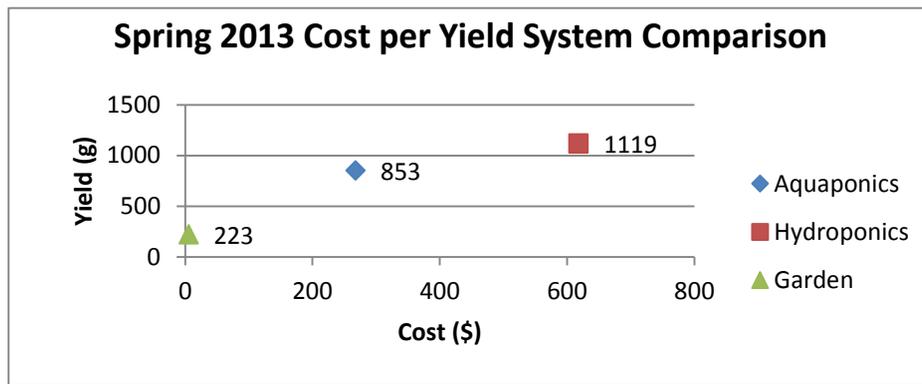
- The following is a list of Professional and Advisory Support of the Biotechnology: NWCTA Stucco –Garden:
- Board of directors:
- Bauman, Kimberly S -Principal
- Management advisory board:
- White, Isaac R -Assistant Principal
- Whitney, Christopher B -Assistant Principal
- Attorney: N/A
- Accountant: N/A
- Insurance agent: N/A
- Banker: N/A
- Principal Investigator/Project Administrator:
- Margaret N. Rees
- Project Manager:
- Elizabeth Barrie
- Project Coordinator and Day-to-Day Project Implementation:
- Sarah Haggerty
- Mentors and key advisors: o Daryl Warren
- Stephanie Spiris

Project Title

Urban Roots Wooster School Comparison Study

Project Summary

This project sought to teach students the importance of growing specialty crops in an urban setting while testing three different growing methods to find out which is most profitable and viable. From October 2012 to October 2014, teachers, students, and volunteers at Wooster High School set up three vegetable growing systems - a raised bed garden outside, a hydroponic system in a classroom, and an aquaponics system in a greenhouse. Comparison studies in the production levels of each system were then conducted as part of Earl Wooster High School's Sustainable Resource Academy program. The results helped determine the inputs and yields of each system to be considered for specialty crop growing in urban settings. By performing side-by-side growing experiments in the spring and fall over two school years and comparing inputs and yields of the same crops in three different growing systems, students gained an in-depth understanding of methods and procedures used in the specialty crop industry.



Project Approach

In the trials, all test subjects underwent the same life cycle: all seeds were sown on the same date and given the same amount of water and sunlight before being transplanted into appropriate systems three weeks later. All systems had an equal amount of plant subjects. Four weeks following transplanting, the subjects were harvested.

In the aquaponic system, fertilizer was offered by fish food fed to 12 goldfish; in turn their feces nourished the plants. In the hydroponic system, 50 mL of the nutrient fertilizer was applied at the beginning of the experiment. In the garden system, one cup of Dr. Earth Organic Fertilizer was added to amend the raised bed soil.

During the seven-week course, all test subjects were monitored frequently by students, as well as bi-weekly by Urban Roots AmeriCorps members and by project parent volunteers. During these times, qualitative and quantitative data was collected regularly. When water evaporated out of the aquaponic and hydroponic systems, water was added. Irrigation in the garden ran daily for five minutes at 5 gallons/hour.

All test subjects were harvested and weighed prior to washing on the same date. After the lettuce was washed, students partook in a salad party where they ate the crops they grew. Again, qualitative data was collected on taste, appearance, texture, sound, and smell.

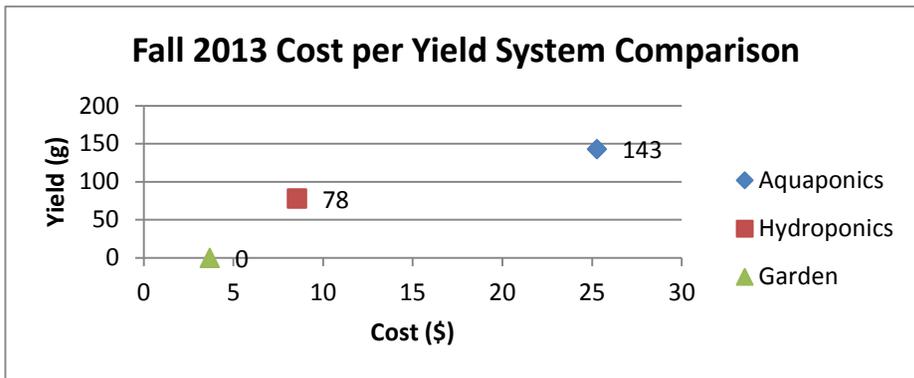
Goals and Outcomes Achieved

Outcome #1: *Understanding of growing food in the three different growing systems. The goal of the project is to expose high school students to growing methods that inspire, teach, and provide yields for the school population, while exposing students to sustainable farming career opportunities after graduation. Measure will be based on project implementation, growing yields, and project data collection.*

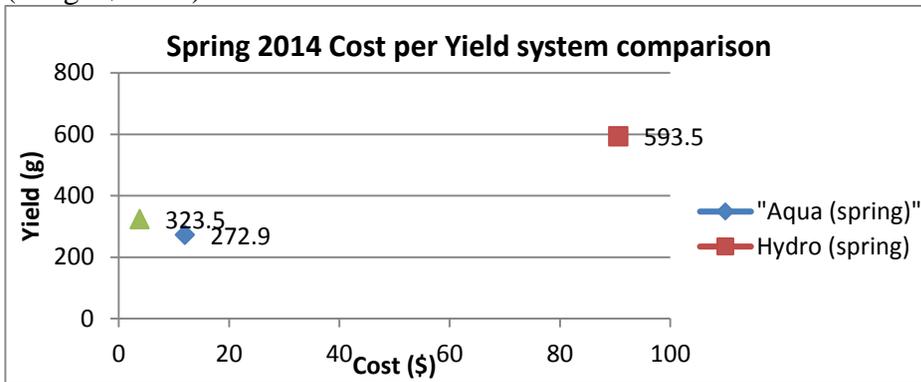
The costs and yields for each growing system and season are listed below:

Trial One: Spring 2013 – The first experiment showed that the hydroponic system produced the largest yield for the largest cost (1,119g / \$617.69). The aquaponic system produced the second largest yield at the median cost (853g / \$267.32). Finally, the garden produced the smallest yield at the lowest cost (223g / \$4.9).

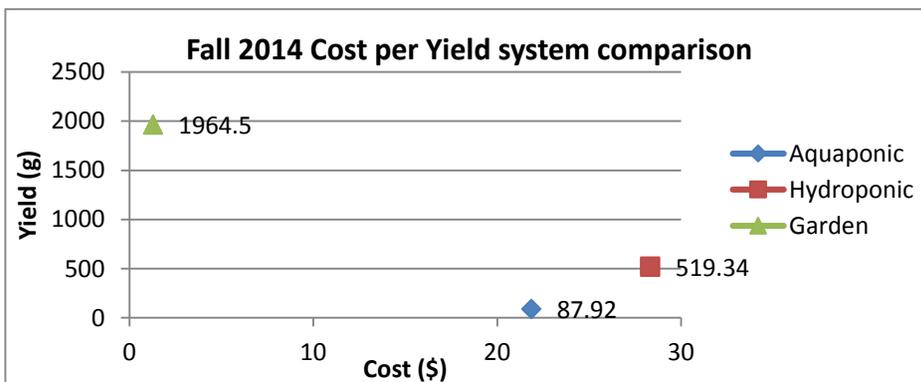
Trial Two: Fall 2013 – In the second round of experiments: the aquaponic system produced the largest yield at the highest cost (143g / \$25.27), the hydroponic system produced the second largest yield at the median cost (78g / \$8.55), and the garden system's yield was nullified because a rodent ate all of the lettuce (0g / \$3.69).



Trial Three: Spring 2014 – The hydroponic system produced the highest yield at the highest cost (594g / \$90.56). The garden produced the second highest yield at the lowest cost (324g / \$3.82), and the aquaponic system produced the least amount of lettuce for less than \$20 (273g / \$12.01).



Trial Four: Fall 2014 – During the final round of experiments, the garden produced the highest yield of lettuce for the lowest cost (1,965g / \$1.28). The hydroponic system produced the second highest yield at the highest cost (519.3g / \$28.33). The aquaponic system produced the least amount of edible lettuce at a relatively high cost (87.92g / \$21.86).

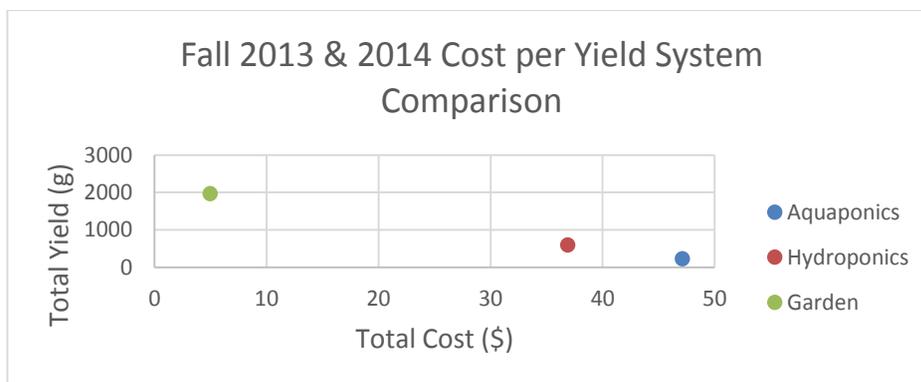


The combined seasonal figures for spring 2013 and 2014 are compiled below. Fall 2013 and 2014 data is also represented.

2013 & 2014 Spring Totals			
	Aquaponic	Hydroponic	Garden
Total cost (\$)	279.33	708.25	8.72
Combined Yield (g)	1125.9	1712.5	546.5



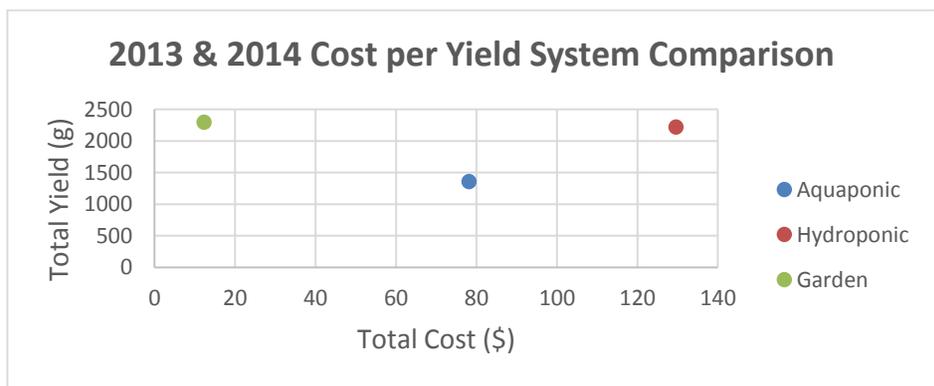
2013 & 2014 Fall Totals			
	Aquaponic	Hydroponic	Garden
Total cost (\$)	47.13	36.88	4.97
Combined Yield (g)	230.92	597.34	1964.5



This data shows that in the spring seasons the hydroponic system produces the largest yield for the largest cost, and the aquaponic system produces the median yield for the median cost. The garden data displays fractions of the hydroponic and aquaponic yields at the lowest cost. The 2013 and 2014 fall cost/yield system analysis revealed that the garden is capable of producing the highest yield at the lowest cost (despite a rodent eating all of the fall 2013 lettuce crop). The aquaponic system produced the lowest yield of viable lettuce at the highest cost of production, and the hydroponic system produced a relatively low yield at a cost of about \$35. It should be noted that all of fall 2013's figures are small.

The figures below represent all data generated across spring and fall seasons.

Compiled 2013 & 2014 Data			
	Aquaponic	Hydroponic	Garden
Total cost (\$)	78.17	129.6	12.28
Combined Yield (g)	1356.82	2220.03	2297.6



This data shows that the garden system produced the largest yield at the lowest cost. Similarly, the hydroponic system produced an almost identical yield, but at a cost much higher than the other two systems. Finally, the aquaponic system produced the median yield at the median cost.

Outcome #2: *Develop approved state standard interdisciplinary curriculum for teaching high school science, math, and literature through growing experiences. Creating a hands-on model that can be replicated, as an alternative for in-class learning is the goal for this part of the project. Student responses and graduation numbers will show the measurable outcomes of the curricular success.*

Through the two years that research was conducted at Wooster, there were 208 high school aged students that were directly involved with the study at Wooster High School. These students benefited from hands on learning as well as interpretation of data collected. The two teachers that taught the classes were beneficiaries of the study by being able to be involved with daily maintenance of different growing systems.

In addition to the students at Wooster High School, students visiting the Urban Roots farm benefited from the work done at Wooster. Urban Roots was able to adapt lessons from the Wooster High School program into activities that have been used on the hydroponics bus, BusAqua, a hydroponics lesson unit was designed by Urban Roots for the Desert Research Institute's GreenBox program, and Washoe County School District teachers participated in workshops designed to introduce them to using hydroponics in their classroom. On the Urban Roots farm, 221 students from four elementary schools, Anderson Elementary, Lemelson STEM Academy, Nevada Sage Waldorf, and Lincoln Park Elementary participated

in basic hydroponics lessons with content adapted from the introductory lessons used at Wooster High School.

In partnership with the Desert Research Institute's GreenPower program, hydroponics lessons developed through the Wooster project have been made available to teachers across the state. By the spring of 2015, Desert Pine High School has used the curriculum with 30 students and Rose Warren Elementary School's science teacher has used the adapted elementary curriculum with all 532 students in their school.

Along with this direct interaction with students, teachers have participated in trainings on the hydroponics curriculum. Both Urban Roots and the Desert Research Institute have offered teacher workshops using hydroponics lessons from the Wooster project. In 2014 and early 2015 41 teachers participated in these trainings. Urban Roots continues to offer these trainings with the next one scheduled for March 2016.

Beneficiaries

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Lessons Learned

Because a rodent consumed all the lettuce crops from the garden in fall 2013, the garden figures are inadequately represented. In the subsequent trials, a row cover was used and the crops were protected from most pests and rodents.

In multiple trials, the exact amount of fish food fed to the goldfish was unknown. A biology educator who wasn't associated with the project fed the fish at his discretion. Thus, the cost of the aquaponic system could vary slightly if we accurately measured how much fish food (fertilizer) was used to produce lettuce crop yields.

Although it is beneficial for many different students and teachers to become involved in maintaining the systems, approaches and techniques vary. Companion planting is generally viewed as beneficial to increasing the health and yield of crops; however, in garden and in aquaponics systems, our test subjects were planted alongside other established plants, that are not "companions." Thus, the growth of the seedlings might have been stunted due to competition for resources in the same space.

When moving into the future with different growing systems, it is essential to reduce the number of uncontrolled variables by isolating each system and addressing its fallacies. In the garden system, for future experiments, row cover could be utilized during all growing seasons to reduce the risk of losing crops to pests. A rodent spoiled the garden harvest of fall 2013; this represents a real-life concern that crops face, and is important for growers to recognize. Furthermore, consistent irrigation is essential prior to the transplanting (for soil viability) and throughout the duration of the experiment.

In the hydroponic system, qualitative data revealed the texture of the lettuce to be soft, and stringy. Not crisp like the garden and aquaponic trials. Moving into future experiments, the light source and distance from the plants could be researched to address the texture of the crops. Additionally, wilting lettuce leaves could be due to a lack of air circulation around the evaporating water system. Thus, a fan to circulate stagnant air was added into the experimental system (and cost) in spring 2013. The fan was limited in that its airflow only reached one of three tiers of our system. Future project plans should include more, appropriate fans or a space with better air circulation.

In the aquaponic system, the lettuce seedlings were transplanted nearby established tomato crops; this could have influenced low yields, in the sense of competition of root systems for available nutrients. Moving forward, the test subjects should be grown alone in the system to mimic the hydroponic system, or all subjects should be exposed to the same neighboring crops. This would offer an opportunity to test companion planting as well to increase yields. It would also be worthwhile to test how well different crops grow in these three systems. Because all three systems had different nutrient sources (fish poop, dry fertilizer, and liquid nutrients), future project plans should aim to have equal levels of nutrients. The most variable nutrient source is the fish poop, and should be assessed. Otherwise, different nutrient tests could be performed to observe optimal levels of nutrients in each system.

Contact Person

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Additional Information

The remainder of the funding from the Wooster High School Grant was utilized to create a hydroponic system at Urban Roots, BusAqua. BusAqua is a decommissioned school bus donated to Urban Roots to use as a year-round growing space and teaching tool to continue the lessons developed at Wooster High School. Crops, primarily heirloom tomatoes, are grown in a recirculating “flood & drain” hydroponics system, which allows plants to grow more rapidly and with less water usage than in a typical geponics, or soil-based, set-up. A solar thermal hydronic heating system is in place to maintain a higher temperature in cold weather. Urban Roots uses BusAqua to teach visitors and students about soilless and indoor growing, controlled environments in agriculture, repurposing of used materials for sustainability, alternative energy and other concepts. Improved hydroponic infrastructure allows Urban Roots to demonstrate the benefits of growing in soilless controlled environments, regardless of season. As Urban Roots operates farm-based educational camps for children during fall, winter, and spring breaks from Washoe County School District as well as summer, BusAqua will provide campers with fresh, organic produce right from the Urban Roots campus, outside the typical growing season. Only planting materials were purchased using SCBGP. The bus and solar panels were donated.

Urban Roots makes all lessons created by the organization available online at <http://www.urgc.org/#!/c4fw>. Lessons on that page related to this project include pH Basics (and Acids), Hydroponics Design, and Exploring Growing Medium. More information on the Desert Research Institute’s Green Power hydroponics box can be found [here](http://greenpower.dri.edu/component/content/article/269-greenpower/greenboxes/4526-hydroponics-grades-6-8) (<http://greenpower.dri.edu/component/content/article/269-greenpower/greenboxes/4526-hydroponics-grades-6-8>) and [here](http://seedstock.com/2013/06/11/desert-research-institutes-greenpower-program-engages-students-with-hydroponics-in-a-box/) (<http://seedstock.com/2013/06/11/desert-research-institutes-greenpower-program-engages-students-with-hydroponics-in-a-box/>).

Finally, the work done by Urban Roots and the Wooster students and faculty on this project led to Dr. Nina Federoff donating \$10,000 to the school to further the work being done there with hydroponics. KOLO 8 news ran a piece on Dr. Federoff’s extension to this project [here](https://www.youtube.com/watch?v=GN3O2aWMz8s) (<https://www.youtube.com/watch?v=GN3O2aWMz8s>).

And for an article on the history of the hydroponics bus at Urban Roots, click [here](http://www.ediblerenotahoe.com/editorial/65-summer-2013/555-summer-2013-ediblenotables-on-move) (<http://www.ediblerenotahoe.com/editorial/65-summer-2013/555-summer-2013-ediblenotables-on-move>).

Project Title

Meet Your Farmer (In-store Pilot Phase 1)

Project Summary

The Nevada Department Agriculture partnered with the local Food Cooperative, Great Basin Community Food Cooperative (Co-op) in order to enhance the competitiveness of specialty crops state-wide by launching the Meet Your Farmer app that will connect consumers to their local specialty crop producers. The app's aim is to provide a simple and engaging platform for the people of Northern Nevada to directly connect with their specialty crop producers and their products. This new technology, using an android and I-phone app, serves as a vehicle to create greater awareness, understanding, appreciation- and subsequent demand- for local specialty crop producers.

The Meet Your Farmer App-Instore Pilot Phase 1 project has worked towards enhancing the competitiveness of specialty crops in Northern Nevada by increasing participation of local producers and local consumers through connecting the two and further enhancing the mutually beneficial relationship with a platform everyone uses today. The concept was to create small stickers that local producers can put on their products (using Augmented Reality). Once a smart phone is pointed at the sticker, an introduction video of the farmer will automatically play on their smart phone or tablet giving the consumer a direct connection with that farmer so they can understand where and how that product was grown, and by whom. The app allows you to literally 'Meet Your Farmer!'

The project is important and timely because the general public is increasingly interested in understanding the provenance of their food. There is a huge opportunity to grow people's awareness, appreciation, and demand for Specialty Crops by leveraging what has become everyday technology. With the Meet Your Farmer App, a genuine connection allows the consumer to directly connect with the farmer at the point of sale. Further, most specialty crop farmers in Nevada are relatively small, and it can be a struggle to build customer awareness and regular shoppers. This app helps enhance much needed farmer recognition.

The project will ultimately directly increase sales of specialty crop produce by allowing the consumer to virtually meet their farmer, which will help them develop an emotional and personal connection to their specialty crop producer. It humanizes the buying experience- people buy from people. If you know the history and get to meet the people who are working hard to bring you produce, the consumers will appreciate and connect with the product on a deeper level. By clearly labeling product from participating operations, which are all located in Nevada, consumers are only able to virtually meet their Nevada farmer. The app will be available to any grocery store or other outlet that supplies local products in order to further promote Nevada specialty crop growers.

**This project was developed based on the results of the SCBGP Meet Your Farmer App Feasibility Study awarded under Parent Award 12-25-B-1241. The feasibility study was conducted to identify the following: Nevada farmers' interest in the Meet Your Farmer App concept; input from specialty crop producers regarding what they would like conveyed via the app; and a comprehensive plan and budget necessary for efficiently developing the Meet Your Farmer App. The Meet Your Farmer App-In-store Pilot Phase 1 serves as the initial*

phase of the project, which was coordinated based on the findings of the feasibility study under 12-25-1241. This project was awarded to begin scripting, coordinating with farmers, to initiate filming, and for app development. Phase II of the project is still underway under Parent Award 14-SCBGP-NV-0032 which is geared towards finalizing edits and marketing the videos created under this award (12-25-B-1474). An additional project titled 'Nevada Specialty Crop Social Media Video Promotions' under 14-SCBGP-NV-0032 builds upon the Meet Your Farmer App concept and will collaborate with project participants under this award to create 8 additional promotional videos. Due to the level of interest expressed by Nevada farmers, multiple projects were coordinated to maximize beneficiaries and increase collaboration.



Context

56% of us have smart phones and this percentage continues to grow. It's predicted to increase to 70% by 2016 (more smart phones are activated everyday than babies born). Smart phones are already a seamless part of our every-day lives. Our phone is the primary source of on-the-go information with the average person using 8+ apps per day.

Project Approach – Phase 1

Phase 1 of Meet Your Farmer featured 3 key parts:

1. The selection of 15 Specialty Crop producers to be involved. 8 additional farms will be identified through the *Nevada Specialty Crop Social Media Video Promotions under 14-SCBGP-NV-0032 which will also highlight specialty crop value added products.*
2. Liaise with each individual producer regarding filming date and content to be included.
3. Visit, film, and edit each SC producer video to final delivery format.

1. Selection

We first needed to select 15 from the initial 42 Specialty Crop producers who wanted to be involved. The 42 interested specialty crop producers were identified during the feasibility study performed under 12-25-B-241.

Our selection process was based on volume and variety of sales of each producer sold via the Great Basin Community Food Co-op. The top 15 producers who were available to be part of the project included the following:

Al's Bees
Avansino Farms
Custom Gardens
Hidden Valley Honey
Holley Family Farms
Hungry Mother Organics
Jacob's Berry Farm
Lattin Farms
Lost City Farms
Mewaldt Farms
Nevada Fresh Pak
New Harvest Farm
Mary Alice Sprouts
Nevada Ag
Smith & Smith Farms

2. Liaison and video content discussion.

Once the first 15 producers had been researched and selected, we proceeded to source contact information and get in touch with each individual SC producer to organize a time and date to film their operation. We also developed a set of questions for each SC producer, which we then emailed to each producer as discussed via a telephone conversation prior to filming. This part we feel was helpful in making each producer confident in what we were trying to capture and also allowed them to feel comfortable for the camera before their video date.

3. Visit, film and edit 15 Specialty Crop producer videos.

After confirming the day before the shoot, we went to each of the 15 different specialty crop producers operations. We would first film the farmer giving us a tour of their property and crops. This allowed for us to get to know the personality of the farmer(s) as well as what they grew and what their plot of land included. We then would find a good spot to spend quality time asking each farmer the list of questions. We had many interesting and full-bodied conversations while recording in order to get high quality and robust footage.

After each visit we would thank the farmer(s) for their time and send a follow up email with an invite to the Launch Day (part of Phase II under 14-SCBGP-NV-0032). After a successful shoot, it was time to get into the studio and go through literally hours of film from each specialty crop producer. The videographer and project manager worked in tandem to ensure the content was not only just visually pleasing but also informative and impactful in order to best tell each farmers' story.

Conclusions and recommendations:

A conclusion in terms of time management included the fact that significantly more time was required to schedule farmers than was initially anticipated took longer than expected. Unpredictable weather conditions contributed to a couple rescheduled shoots. In addition, two farms were experiencing pest problems and wanted to postpone, which although is a natural phenomenon, was unexpected.

Calling the farmers seemed to be the best way to get in touch. This introductory phone call to explain the project was essential in getting buy in, however sometimes it took up to two weeks to connect with some of these busy farmers. We also followed up with an email that day as well as the day before the shoot but most of the farmers didn't confirm receipt, which added a little bit of stress wondering if the farmer remembered!

One outstanding, favorable development was that the farmers came across really likeable on camera naturally lighting up when talking about their story, passion, and livelihood.

Some of the unusual developments were getting creative with the camera work if there were rows or parcels of land that had been harvested or were laying fallow. Capturing the personality of the farms was made a little more interesting through the use of a drone camera the videographer brought to many of the locations.

Links to 15 first films:



[Meet Your Farmer - Al's Bees optimized.mp4](#)



[Meet Your Farmer - Avanzino Optimized.mp4](#)



[Meet Your Farmer - Custom Gardens Optimized.mp4](#)

 [Meet Your Farmer - NV Fresh Pak Optimized.mp4](#)

 [Meet Your Farmer - Nevada Ag optimized.mp4](#)

 [Meet Your Farmer -Hungry Mother optimized.mp4](#)

 [Meet Your Farmer - Pleasant Valley optimized.mp4](#)

 [Meet Your Farmer - Jacobs Berry.mp4](#)

 [Meet Your Farmer - Hidden Valley Honey optimize...](#)

 [Meet Your Farmer - Al's Bees optimized.mp4](#)

 [Meet Your Farmer -Holley family optimized.mp4](#)

 [Meet Your Farmer - Smith and Smith.mp4](#)

 [Meet Your Farmer - Lost City Optimized.mp4](#)

 [Meet Your Farmer - Lattin optimized.mp4](#)

 [Meet Your Farmer - Mewaldt optimized.mp4](#)

 [Meet Your Farmer - New Harvest optimized.mp4](#)

Goals and Outcome Achieved

The goal was to create 15 fantastic videos about a selection of Nevada's specialty crop producers that were concise, engaging, and inspiring to people watching. This goal was achieved and each of the 15 films is beautifully and professionally done. Each film is different yet equally fun to watch. Due to the wide variety of people and farms involved, the films give a glimpse into Nevada's farming community. Each farmer's unique story is captured! The films will not only be used for promoting operation in the Great Basin Food Co-op but are also anticipated to be used by restaurants sourcing local ingredients, by the NDA via their webpage, by producers directly, among others.

The Meet Your Farmer aimed to accomplish the following goals in conjunction with phase II which is still active under 14-SCBGP-NV-0032:

Increase customer awareness, knowledge, appreciation, and to directly increase sales of specialty crops in Nevada. It was predicted that a 20% increase in sales of specialty crop produce would be the result of phase 1 and phase II. The phase 1 project was reallocated

from a previous project and it only allowed for 12 months to complete the scripting, filming, farmer collaboration, and app development. The app is still new to the store and was launched in September 2015. To date, the Great Basin Food Co-op has experienced a 47% increase in specialty crop sales year over year after the launch of the App from \$7512.91 in October of 2014 to \$11,072.01 in October of 2015. Although this increase cannot be directly attributed to the project, the attendance at the app launch event in October is anticipated to have heavily influenced the rise in specialty crop sales.

It is still early to gauge the impact of phase I of the project since phase II is so critical to promoting the app/videos. The impact will be better gauged in phase II, which is geared more towards marketing and will allow more time to assess the overall impact on sales. In addition, as other restaurants, non-profits, government agencies further promote the videos, this will also impact sales for participating operations, although this would be difficult to attribute solely to the project.

The launch day of the Meet Your Farmer App coincided with the Great Basin Community Food Co-op's 10 year anniversary party. To celebrate together roughly a dozen specialty crop producers had a farmer's market and a few hundred people were in attendance. To quantify a more specific figure, the Co-op had over 260 sales.

Examples of in-store Meet your farmer stickers:



Beneficiaries

Each of the 15 farmers will receive a copy of the video for their own marketing purposes at no cost to them. The NDA will promote these videos via their website which will further benefit growers. The Great Basin Community Food Co-op will also be able to use the videos in their communication to their thousands of member-owners. Nevada Grown, a non-profit organization, will also benefit from sharing the films on their website after the initial in-store pilot launch (Phase II). Consumers will benefit by increasing their knowledge on Nevada specialty crop production and growers.

Lessons Learned

We needed more time to liaise with farmers. It was more difficult and time intensive to schedule each film. We were hoping to be able to do a few in the same day at similar locations but farmers are busy people! They are also very prideful and wanted their places to look camera ready, which proved a delicate balance between the farm looking bountiful and the farmer having enough time in between harvests.

Some of the farmers were a little nervous and camera shy. Not much we could do here but was something that was just slightly tricky to overcome.

Farmers are natural storytellers. They're proud to tell their story and consumers are eager to hear them.

Contact Person

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Project Title

Enhancing the Specialty Crop Industry through innovative Program Management

Project Summary

The purpose of the State of Nevada NDA project was to promote and enhance the competitiveness of specialty crops in Nevada by providing personnel services, outreach, technical assistance, and project oversight throughout the award. The objectives of the award included providing outreach in order to obtain more qualified candidates, in addition to sub-recipient technical assistance to ensure that appropriate assistance is provided in order to accomplish project goals.

Prior to Nevada Specialty Crop Grant Program staff being in place, outreach, promotion and program management were not being routinely provided due to limited staffing availability within the NDA. As a result interested applicants were not receiving the information they needed in order to identify whether projects were appropriate for the SCBGP. Further, potential applicants were not familiar with resources available to assist them in preparing a complete proposal. Sub-recipients were not receiving the oversight needed to ensure that project goals were being accomplished nor were they receiving information regarding modification procedures, reporting requirements, methods for enhancing outreach efforts, etc.

This project was awarded to address program management and outreach needs by providing funds for program SCBGP staff.

Project Approach

General program duties were performed daily to ensure compliance with the SCBGP requirements. The sub-award agreements were reviewed and modified in collaboration with the Nevada Attorney General's Office to ensure that NDA would be able to take appropriate action if laws were being violated or if sub-grantees were not following program requirements. This was also a critical step in order to properly inform sub-grantees regarding their obligations as they signed their awards.

General program management included timely review of request for reimbursements to verify appropriate expenditures reflect approved scopes of work. Timely reports were received by sending notices to sub-recipients, a minimum of 30 days (typically 60 days) prior to the date reports are due to NDA. This allowed NDA a minimum of 30 days to review reports and to follow-up with questions prior to submitting a complete report to USDA. Reports were thoroughly reviewed to ensure activities reflect program requirements and agreements.

Outreach was performed at events/meetings that were anticipated to have significant involvement from specialty crop industry stakeholders. Events included the Southern Nevada Agriculture Conference (SNAC), Small Farms Conference (SFC), GAP trainings, trainings coordinated by the Western Nevada College Specialty Crop Institute, and Nevada Cooperative Extension trainings.

Staff participated in the 2013, 2014, and 2015 Small Farms Conference planning meetings in order to incorporate specialty crop sessions specific to industry needs. As a result, conference sessions on cut flowers, permaculture, herbs, value-added processing, fruit production, hoop house production, and food safety were incorporated into the conferences.

Promotional materials were created to disperse at outreach events with the goal of engaging more interest in the program and to attract appropriate applicants. Materials included annual award newsletters, a SCBGP brochure, program flyers, and the annual Request for Proposal document. In addition, the Nevada SCBGP website was updated to include changes to the program and guidance materials provided by USDA and created by NDA.

To assist applicants new to the SCBGP or to grants in general, two workshops were coordinated during the grant. The workshops included information on eligibility requirements, best practices for writing grant applications, reporting requirements, and exercises on preparing goals and expected measurables.

Goals and Outcomes Achieved

Goal 1: *Ensure program compliance by monitoring sub-recipient activities through inspection of service provider operations to ensure adherence to program objectives; document and report all discrepancies and provide suggestions regarding proposed improvements. Conduct reviews of financial records and reports submitted by service providers to ensure the appropriate and efficient usage of monies received and/or reimbursed. Conduct 10-15 site visits per year. Periodic reviews of requests for funding and*

items actually purchased. Program violations will be tracked and documented throughout the grant period.

Approximately 30 site visits were performed over the grant period which allowed staff to identify project status, concerns, and necessary revisions. In addition, staff were able to identify additional successes and struggles of individual projects that are not always conveyed by sub-recipients in annual reports. Program staff maintained pertinent site visit summaries in order to include relevant information in reports that may not have been included by sub-recipients.

Ten meetings were conducted with potential/existing applicants where technical assistance was provided on the pre/post award process. These meetings were also used to identify frequently asked questions, which has been posted to the NDA website. All individuals that received technical assistance via an individual meeting, submitted a full application throughout the grant award. In addition, approximately 30 meetings were attended throughout the grant in order to gain insight regarding specialty crop industry needs and to express training needs that can be incorporated in state conferences or by the Western Nevada College Specialty Crop Institute.

Goal 2: *Increase program awareness and outreach to over 250 growers, educators, new and beginning farmers, and numerous stakeholders at every opportunity will enhance the goals of the SCBGP. Outreach at the 2013 Small Farm Conference alone will reach 250 eligible participants. Attendance to four grower workshops has the potential to disburse information to approximately 50-150 participants per workshop. The success of the project will be measured by attendance to these functions, an increase in the NV SCBGP contact list, and website hits. The contact list is expected to increase from 230-255 over the grant period. Individuals will receive information through interactive contact by staff participation and availability to increase this list as much as possible. The website visits are expected to increase from 35-75 visits per month. Visits will be monitored through the state website counter and webmaster. Participation in workshops and other functions will be measured through surveys. Attendance to these functions by stakeholders has risen each year and is expected to continue that pattern. Larger workshops can have anywhere from 100-150 and medium size classes 35-50. These numbers will be examined as they continue to grow and change.*

The Program Manager sought out disadvantaged farmer contacts and program enhancing projects through various outreach activities. Activities included participating in stakeholder meetings in order to identify local needs, sending materials to producer trainings, creating outreach documents, and coordinating a SCBGP workshop for January 2014 and March 2015. Attendance at farmer events and outreach provided via word of mouth has generated inquiries about the program.

Two newsletters were created during the project outlining projects awarded for 2013 and 2014. The newsletters have proven to be an effective outreach tool in providing interested applicants an overview on the appropriate projects for the SCBGP. Each newsletter includes a brief summary of individual projects, in addition to their goals and beneficiaries. The newsletters are available on the Nevada SCBGP website and were available at the 2014 and

2015 Small Farms Conference, reaching an estimated 500 people. In addition, as inquiries were received, the latest newsletter was sent via email along with the latest RFP. The newsletters were also sent to the contact list, reaching 247-330 people over the grant period. The newsletters can be found at http://agri.nv.gov/Plant/SpecialtyCrop/Specialty_Crop_Block_Grant_Program/.

The proposal indicated that increases in participation would be measured by the web counter. From January 2013-September 2015, the website received 3,056 visits. Although not all direct inquiries received met the requirements of the program, individuals that presented potentially eligible projects were added to the contact list with notes outlining their project interests. This has allowed staff to capture eligibility information on the inquiries received in order to follow-up with interested applicants as the request for proposals were released.

Events/outreach: Staff attended and assisted with the session planning, as a specialty crop industry representative, for the 2014 and 2015 Small Farms Conference. Approximately 250 participants attended each conference, which primarily consisted of specialty crop growers. Several phone/email inquiries were received following the event. Two projects were presented at the conference 2014 conference and one project was highlighted at the 2015 conference. This event attracts specialty crop growers throughout the state and provides opportunity for promoting the program and previous projects. Also attended were four Good Agriculture Practices Workshop where 75 total participants were in attendance. Staff discussed the grant, previously funded projects, and application deadlines. Five agriculture educator workshops were attended with approximately 170 specialty crop producers in attendance. Advertising was performed through local ads, brochures, press-releases, and social media. In addition, 4 farmers markets were visited and program information was provided to market managers.

Staff continue to document eligible inquiries that are received and direct individuals to the website. The contact list has increased from 247 to 330 over the past three year period.

Goal 3: *Increase program productivity by conducting workshops, providing Technical assistance and developing program guidelines. Educating/informing recipients and potential applicants of guidelines and policy and procedures will increase program performance. Projects will achieve higher performance when recipients are informed of program expectations and guidelines, ensuring each of the projects are well developed and managed properly. Workshop attendance will be tracked as well as project outcomes.*

In March of 2014 staff provided technical assistance to interested applicants through hosting a workshop on general grant writing, SCBG Program Requirements, and previously funded projects. Approximately 15 participants were in attendance for the workshop. In March 2015 the program manager collaborated with the University of Nevada Cooperative Extension to host a grant writing workshop. SCBGP staff discussed the program requirements for the SCBGP and the FSMIP grant and UNCE discussed the Farmers Market Promotion Program and Local Foods Promotion Program. An estimated 20 participants were in attendance and training is anticipated to have helped attendees identify the most appropriate funding source for their project ideas and provided participants with general best practices for writing a grant

application. Out of the attendees that participated in the 2014 and 2015 workshops, approximately 20% submitted full proposals, all of whom were selected for funding.

Staff released the 2014 and 2015 Request for Proposal, reviewed Letter of Intent to apply, and addressed technical questions on proposals and letters. In 2014 twenty-two proposals were received and fourteen were selected for funding. In 2015, twelve Letters of Intent were received and ten full proposals were selected for funding. Each applicant that was awarded funding was in contact with program staff and received assistance with interpreting program requirements. In addition, staff assisted applicants with identifying potential partnerships with groups involved in similar efforts. Staff arranged the review committee and provided background information on newly submitted projects that were building upon previous projects. The State Plan was prepared and submitted in a timely manner along with any needed revisions.

Beneficiaries

The SCBGP recipients that were awarded projects throughout the three year grant are the primary beneficiaries. They were provided with the technical assistance and outreach needed in order to prepare complete and well-formed projects. Beneficiaries of individual projects were indirectly impacted, as they would not have received the knowledge/resources provided by awarded projects without staff available to assist project leads through the grant process.

Lessons Learned

Nevada has limited specialty crop production, in comparison to neighboring states such as California, and has a relatively small agriculture community. Many growers and industry stakeholders are intimidated by the requirements of grants and require assistance on the grant process, in planning a successful project, building partnerships, etc. As a result, providing program staff to guide growers and industry stakeholders through the grant process is critical to receiving proposals that reflect SCBGP goals. Often times an applicant may have an excellent project idea that is ideal for the program, however they may struggle in conveying the project on paper according to the application requirements. This further demonstrates the importance of providing staff that can help potential applicants interpret grant requirements, utilize beneficial resources, and form partnerships with those coordinating or interested in similar projects. Program staff also help minimize duplicated efforts in the state, which often occurs even within the smaller communities.

Outreach materials are a critical piece to informing new applicants of the grant requirements. The annual newsletters proved most effective as they gave interested applicants a more immediate understanding of the types of projects that are eligible in addition to the fact that they must have measurable goals and multiple beneficiaries. Program staff will continue to create annual newsletters as an outreach tool.

Over the duration of the grant, difficulties were experienced with two sub-grantee continually failing to respond to correspondence and submit on-time and complete annual reports. As a result, program staff needed to take action to notify these sub-grantees that this will not only hold-up or prevent future payments, but will also significantly impact future program eligibility. In addition, they were informed of the importance of submitting complete and timely reports, as this provides justification to continue federal funding for the program and

demonstrates to legislatures that the money is being used accordingly. A lesson learned from this challenge was to provide a background sheet emphasizing previous performance with new proposals that are submitted by former sub-grantees. This allows the application review committee to make informed decisions regarding whether previous recipients should still be considered for funding or if they are a high risk. Staff are optimistic that this will help minimize poor performance in the future and will continue to employ this management method.

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Additional Information

Website: http://agri.nv.gov/Plant/SpecialtyCrop/Specialty_Crop_Block_Grant_Program/

Thank you for your continued support on the SCBGP!