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ANNUAL PERFORMANCE REPORT  
SOUTH DAKOTA DEPARTMENT OF AGRICULTURE  
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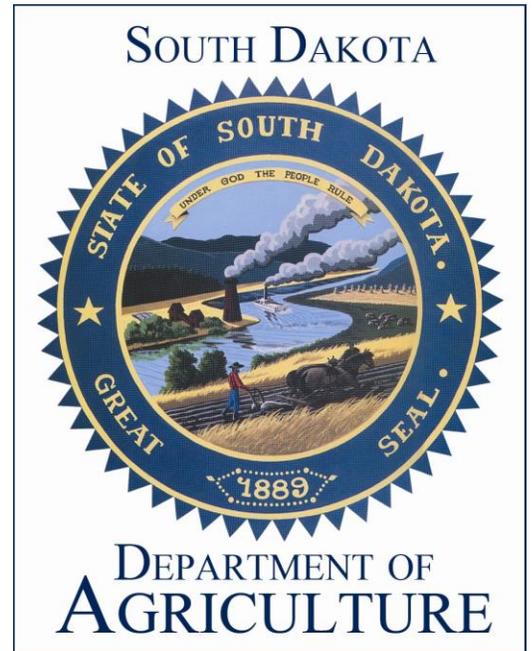
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TABLE OF CONTENTS

Project 1	Piedmont Valley Vineyard- Off Grid Smart Irrigation
Project 2	Dakota Rural Action- Terminated Project
Project 3	Black Hills State University- Straw Bales Greenhouse
Project 4	South Dakota Department of Health
Project 5	Stewart's Aronic Acres- Haskap/Honeyberry Fruit Production
Project 6	South Dakota Department of Agriculture
Project 7	South Dakota State University
Project 8	South Dakota Specialty Producers Association
Project 9	Dakota Hops LLC
Project 10	South Dakota State University
Project 11	South Dakota State University
Project 12	South Dakota Specialty Producers Association
Project 13	Cheyenne River Youth Project
Project 14	South Dakota Department of Agriculture



# PROJECT 1

**Piedmont Valley Vineyards & Farms**  
**South Dakota Department of Agriculture**  
**Specialty Crop Block Grant Program**

**Project Title: Development and Demonstration of a Sustainable Off-Grid Smart Vineyard Irrigation System**

## **Project Summary**

Drought is one of the greatest impediments to agricultural production. For South Dakota grape production, inadequate irrigation is one of the most common reasons for crop failure, particularly in vineyard establishment. Little to no data exists on proper vineyard irrigation in our climate. Rather than rely on intuition, as is the current practice, newer, sensor-based technology has been created to guide irrigation based on the needs of the plant. This project established a 'smart' irrigation system integrated into a novel off-grid water-harvesting system. The system runs by solar power, embedded into a water-harvesting structure to offset the need for an external water supply.

## **Project Approach**

The primary objective of this project was to build a water harvesting structure capable of conveying rainwater from a holding tank to the vineyard. For this purpose, we constructed a 90 x 45' permanent structure with gutters that collect rainwater and convey it to an 1800 gallon water tank buried at one end of the structure. The holding tank has a water line tied into our main irrigation line, which allows water to be pumped via solar powered water pump. We are currently in the process of implementing a controller system that measures and logs flow rate, which allows for real-time monitoring of water use and water availability. Over the next few years we will compile these data and compare water usage/requirements to yield, which will provide context for vineyard water needs based on prevailing growing-season weather patterns.

In late August, 2017, we held a project tour in conjunction with the South Dakota Specialty Producers Association. We gave an overview and demonstration of the project to approximately 25 attendees. Additionally, GenPro representatives made a brief presentation on the solar equipment used in our project with possible future applications for other growers. Light refreshments were served.

<b>Initial Goal</b>	<b>Performance Measure</b>	<b>Benchmark</b>	<b>Initial Target</b>	<b>Outcome</b>
Design an irrigation system run entirely on solar power	Monitoring irrigation requirements and necessary energy demands (e.g. pump usage)	No data exists. This project has not been demonstrated in its entirety	100% off-grid or self-generated energy through an effective design and use of solar power	Solar panel and associated pump installed.
Implement a sensor-based irrigation system to increase water use-efficiency and decrease well water usage	Install an irrigation system that supplies water based on needs ascertained through micrometeorological measurements of evapotranspiration	No research has been completed on the ability for the climate of western South Dakota to supply ample water on a rain-fed basis	The goal of this project is to design a water harvesting system that can store enough water during dry periods to offset rainfall deficits	Data is currently being gathered to create an effective irrigation strategy
Generate an effective irrigation schedule, which may be implemented throughout western South Dakota	Sensor-based irrigation allows for application of water as it is needed by the plant rather than guess-work. This project will demonstrate this system and the impact it can have on productivity	Again this research has not been conducted for our area. It has been successfully implemented in other grape growing regions of the country	Generate water demand curves to validate this approach and quantify the water needs of economically important grape varieties, specific to our climate	Monitoring sensors have been installed to complete this objective

## **Goals & Outcomes Achieved**

The goal of this project is to demonstrate a sustainable vineyard irrigation system under the more arid climate of western South Dakota. Sustainability is derived through a system integrating both solar power to generate the energy to run the irrigation and a water harvesting structure to supply (or at least offset) the water demand for the vineyard.

### **Beneficiaries**

Because of its multifaceted design, the data and knowledge generated from this project have the potential to benefit a wide range of audiences. South Dakota wine production is currently growing at a rate of 17% per year. New vineyards are being started throughout the Black Hills region and existing vineyards are looking to expand to meet the growing demand for locally produced wines. This project will not only hone irrigation water needs through the use of smart sensors and deficit irrigation, it will also demonstrate the capacity for harvesting rainwater and measure what portion of the total water demand can be satisfied through this source.

Currently, irrigation in this region is done more intuitively rather than soil-based. The most common failure in new vineyard establishment is inadequate irrigation. Failure to accomplish this can set vineyards back an entire year, causing significant financial loss. This project will provide the infrastructure to produce a demand-based irrigation system based on our local climate, all in a more sustainable manner. These data can then be shared and applied to vineyards all across the region.

Finally, this project is novel in that it also integrates a solar power generation capacity to run the entire system. To our knowledge, this system has never been tried for a project of this nature. Thus, the goal for this project is to demonstrate the feasibility of this integrated system, which may then be expanded and implemented at other vineyards based on our results. The success of this project would enhance producer competitiveness through marketing a more sustainable and green vineyard system, which may be scaled to larger operations or other specialty crops (e.g. fruit trees, hops and numerous produce applications). We will continue to work with the South Dakota Specialty Producers Association and SDSU Extension to ensure that this information is distributed to their networks and make the project available to anyone interested in replication.

### **Lessons Learned**

We experienced delays with the build of our structure. We had contracted with an individual to tear down move and then rebuild the greenhouse. Unfortunately, that person only completed the tear down and move and then left town with our money. So we had to find someone else to set up the greenhouse. The next contractor we hired set up the greenhouse, but did so incorrectly which resulted in the cover being torn off in a wind storm. We had to purchase a new cover and put that one on ourselves. We've already addressed all the issues we've had, since our project is now complete. However it did cost us additional money and time. Both of which Mikayla and Chris covered personally. Additionally – although the structure we have used provides a large surface area to capture the most rainwater, the time, money and effort expended (all under the assumption that we would save all three by reusing an already existing structure) would have been better spent purchasing a new structure.

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Finally, we would like to thank the South Dakota Department of Agriculture for giving us the grant. We believe the system we have put in place and the data we will gather will not only be useful to specialty crops like grapes, but could provide a meaningful and sustainable watering system to many other types of crops grown in South Dakota.

## **PROJECT 2 TERMINATION**

**APPLICANT: DAKOTA RURAL ACTION**

**TITLE: BUILDING THE CAPACITY FOR INCREASING THE USE OF SPECIALTY CROPS IN SCHOOL AND INSTITUTIONS WITH FOOD HUB PILOT PROGRAM IN NORTH DAKOTA AND SOUTH DAKOTA**

PROJECT TERMINATED IN 2016

## **PROJECT 3**

**APPLICANT: BLACK HILLS STATE UNIVERSITY**

**TITLE: BHSU STRAW-BALE GREENHOUSE**

South Dakota Department of Agriculture  
2014BHU01

BHSU Strawbale Greenhouse

Final Performance Report

January 23, 2018

This project is supported by the Specialty Crop Block Grant Program and the U.S. Department of Agriculture through grant 12-25-B-1487. Its contents are solely the responsibility of the authors and do not necessarily represent the official views of the USDA. 1

## **Project Title: BHSU Strawbale Greenhouse**

### **Project Summary**

Spearfish, South Dakota has a history of local specialty crop production ever since food was sent up the hill to the Black Hills gold mining region. Today, there is a small, yet vibrant, community of local producers and retailers who work to provide food for local consumption.

Spearfish Local is an initiative of Black Hills State University's sustainability office that formed in June 2014 to identify barriers and solutions for expanding the local food economy. The energy and enthusiasm from the first annual Spearfish Local meeting made this the perfect time to perform analysis on our local food system, begin to market and advertise local food in Spearfish to reach new producers and consumers, and increase community knowledge of our local food economy.

A key need identified by local producers at our first Spearfish Local annual meeting was the need for more producers. This project, including the foodshed analysis and cafeteria report, provided valuable and needed information to the community so that new and existing producers can make better decisions, which will increase short-and long-term successes.

We can significantly increase local food consumption by working directly with cafeterias, which typically serve larger populations on a regular basis. Cafeterias in the Spearfish area include nursing homes, public schools, private schools, daycares, hospitals, and BHSU's dining hall. Cafeterias present unique barriers for local food suppliers. Often, cafeterias in school, medical, or nursing home settings are required to supply their menus up to a year in advance to meet funding and nutrition requirements. During this project, we focused on particular needs of cafeterias in order to expand local food to this untapped market.

There has never been a comprehensive effort to inform the Spearfish community on how, where, and why to purchase local foods. Community members and tourists need to be able to identify retail locations and restaurants who sell locally grown, raised, and processed food. Businesses need a clear way to promote their commitment to locally-sourced food. This project increased the awareness for thousands of community members and visitors by creating a recognizable local food badge and cooperative marketing campaign.

Local foods education in the Spearfish community was needed, as witnessed by our abundance of fast food restaurants as compared to our single small farmers' market (more than 10 times more fast food restaurants; [www.nichg.org](http://www.nichg.org)) and the lack of fresh food in our public schools. There is no standard wellness program for K-8 children in Spearfish Schools. Through this project, we worked with teachers and BHSU outdoor education students to develop programs for elementary-aged youth to learn about growing their own food.

BHSU students were involved in each step of this project to further their classroom learning into real-world experience.

## **Project Approach**

BHSU worked with students to complete local food research, create a marketing campaign and Spearfish Local badge, and educate youth about local food.

BHSU Masters of Science in Sustainability student, Tracy Sigdestad, completed and defended a regional foodshed analysis of Lawrence, Butte, and Meade Counties and accompanying Geographic Information Systems database. This project also served as her Master of Science in Sustainability capstone project, with a capstone committee consisting of two BHSU professors and a local farmer who assessed her progress regularly and gave the final review. This report focused solely on specialty crops.

The cafeteria analysis performed in 2015 by undergraduate intern, Ross Edison, provided the research and information needed to show the distribution gap for cafeterias to purchase local food. Through this project, we learned that only one cafeteria in Spearfish purchased local food, and did so only once per year buying sweet corn for an event. The reasons were consistent among all of the cafeteria managers and chefs we spoke with: price, not knowing who to contact, and inconvenience (including scheduling pick-up or delivery and having to pay multiple small invoices).

The cafeteria analysis has had a big impact on the local food market already. We used this information to apply for funding to the USDA Local Food Promotion Program to begin a food hub for the Black Hills. Through this other funding, we launched the Black Hills Food Hub with the start of the harvest season in May 2016. We are now working with over 20 area farmers (from several communities around the Black Hills) to aggregate local food to sell and deliver to large-scale cafeterias under one simple invoice. The Black Hills Food Hub benefits meat producers as well as specialty crop producers, but is not funded by the Specialty Crop Block Grant.

There is currently more demand between the large-scale cafeteria clients of the Black Hills Food Hub than we are able to fill. The food hub management works to inform current and new producers about what produce the cafeterias have committed to purchasing. The expanded market into these cafeterias will help new producers gain confidence that their produce will have a buyer.

In partnership with the Spearfish Chamber of Commerce, we created a Spearfish Local badge to identify businesses who sell locally grown, raised, or processed food. The Spearfish Local Advisory Council met to establish fair and consistent criteria to identify these businesses. Local businesses are invited to submit a free application for the Spearfish Local badge and receive door and window decals and free advertisement as a local food provider. Businesses will be able to use the badge as a marketing tool on private advertisement as well. Each business is required to prove that they sell or cook

with local food at least seasonally by submitting a form with their information and where the food is grown. The Spearfish Local Advisory Council agreed that the requirement for the badge is just to purchase one local food item because that makes a difference and creates relationships that open doors for more sales in the future. The businesses certified include producers, retailers, and restaurants. We list each business on our website: [bhsu.edu/spearfishlocal](http://bhsu.edu/spearfishlocal) and include their names on flyers and ads used for events and promotion of the program. Our Spearfish Local logo, designed by a BHSU graphic design student, is displayed throughout town through our window clings and stickers. In addition to tabling at events throughout the year, each year we've picked one big way to promote the businesses. We purchase a full-page newspaper ad in 2015 listing each business. In 2016, we hosted a Spearfish Local Ice Cream Social where over 100 community members came out for ice cream (with local ingredients) and to visit tables set up by Spearfish Local businesses. In 2017, we purchased an ad in the Chamber of Commerce's In-Room Guide, a booklet provided in hotel rooms in Spearfish, to encourage tourists to try our local fare.

Spearfish has untapped potential for tourist demand for local food. We also have a need to attract new producers to the area. We started a multimedia project with student interns to make short, attractive videos for consumers and new producers. In a "know your farmer" style approach, local farmers and businesses who sell local food were featured in 11 vignettes. Information included what makes their food unique and how consumers can find them. By making these videos available online, tourists and potential farmers will be able to access the videos from anywhere and use the information when they plan their trip to Spearfish.

To extend the growing season into the school year in order to engage more youth, we rented space in a local farm's straw-bale greenhouse to plant starts for our organic garden and teach the community about sustainable ways to grow produce in our climate. The insulation from the straw-bale construction allows for planting well ahead of a typical greenhouse. The starts we planted in the greenhouse in March 2015 were transplanted in the BHSU campus outdoor garden in June. The resulting harvest of which went to the campus cafeteria.

We hosted three tours in the greenhouse for 3<sup>rd</sup> grade students in the Spearfish Public Schools where they also learned about ecosystems and how farm activities change by the season. When they were back in school, the students had to make a presentation to their peers about what they learned. All 4<sup>th</sup> graders participated in a program we organized on their school campus to learn about how fruit and vegetables are pollinated and play a relay race that demonstrated the difference between fresh and processed food.

Each summer, we've hosted the Sting's Eco Explorers day camp, where participants aged 4-12 visit the BHSU outdoor garden and learned about the variety of vegetables and fruits growing there, the parts of a plant that we eat, and reasons why people would want to eat locally grown food.

In 2016, BHSU worked with area daycares Children’s First, Kids Club, and the Little Jackets Learning Center to set up planters for summer vegetable growing. We worked with the Northern Hills Master Gardeners to train the preschool teachers so that they could continue planting in future years.

Many partners were engaged in the process of this project. The Spearfish Local Advisory Council is a forum for the representatives of the local food system to communicate and address issues that affect food in our city. The Council meets several times throughout the year and helps guide the direction of Spearfish Local.

Members include:

- City of Spearfish Mayor, Dana Boke, and Director of Public Works, Cheryl Johnson
- Black Hills State University staff Katie Greer, Petrika Peters, and Adjunct Professor Carrie Gray-Wood
- Spearfish Chamber of Commerce Executive Director Melissa Barth
- Red Barn Farmer’s Market and Black Hills Milk owner Dawn Habeck
- Cycle Farm owner Trish Jenkins
- Regional Hospital Dietician Rebecca Dorsett
- Cobblestone Science owner Rachel Headley

Additionally, BHSU staff time from our Communication and Marketing Department has been provided in-kind for press release writing and media coordination. Two professors and a community farmer have dedicated time for the capstone committee for the foodshed analysis.

The Creekside Elementary 3<sup>rd</sup> grade, Children’s First, and Little Jackets Learning Center Teachers, Cycle Farm, and the Northern Hills Master Gardeners worked with us to coordinate the children’s educational programming.

Local businesses, including farms, retailers, and restaurants are displaying the Spearfish Local badge to generate pride in local food in our town.

26 businesses signed up for the Spearfish Local badge. The Spearfish Chamber of Commerce and participating businesses distribute our Spearfish Local logo stickers.

## Work Plan

<b>Project Activity</b>	<b>Responsible Party</b>	<b>Start</b>	<b>End</b>
Hire and manage Spring Interns	Greer, Headley	1/2015	5/2015
Foodshed Analysis Part 1: methodology plan, data collection, interviews, mapping	Headley & Fall Graduate Intern	1/2015	12/2015
Videography: script writing, interviews, editing, data storage	Greer & Fall UG Intern #1	1/2015	10/2016
Cafeteria supply and demand analysis	Greer & Fall UG Intern #2	1/2015	5/2015

Spearfish Local Advisory Council badge requirements meeting	Headley	9/2014	11/2014
Final cafeteria report disseminated	Greer		12/2015
Hire and manage Fall Interns	Greer, Headley	8/2015	12/2015
Spearfish Local badge advertisement and certification	Headley	12/2014	9/2015
Foodshed analysis part 2: Collect data, report writing, final map, report dissemination	Headley & Spring Graduate Intern	8/2015	1/2016
Videography: finish interviews, final edits, dissemination	Greer & Spring UG Intern	4/2015	10/2016
Garden season extension planting and educational activities	Greer	1/2015	5/2015
Three Straw-bale greenhouse tours	Greer	11/2014	5/2015
Hire and manage summer intern	Greer, Headley	4/2015	5/2015
Final “Know Your Farmer” videos posted and shared	Greer		10/2017
Final foodshed analysis report published	Headley, Greer, Peters		10/2017
Spearfish Local annual meeting	Headley, Greer		8/2016
Campus garden planting, volunteer organizing, educational events, cafeteria pilot project	Greer & Summer UG Intern	5/2015	10/2016
Finalized cafeteria report which includes pilot project analysis	Greer	1/2016	10/2016

## **Goals and Outcomes Achieved**

### **Goal #1:**

Increase the number of local producers.

*Performance Measure:* 5 new producers over the next 5 years

*Benchmark:* Currently 10 producers in the community

*Target:* 1 new producer by the end of the project period

*Performance Monitoring:* We will receive annual reports from the South Dakota Local Foods Directory.

We worked toward this target by increasing the market for local food in our region. Through the foodshed analysis and cafeteria analysis, we aimed to inform current producers and future producers of supply gaps that they can fill. Our marketing and educational campaigns were intended to raise consumer demand for local food.

Spearfish has two new producers since the beginning of the grant period. Best Day Farms in Spearfish started in 2016 due to the demand created from the Black Hills Food Hub. Column Greens, a new hydroponic operation, began in Spearfish in 2017.

## Goal #2:

Expand consumption of local foods

*Performance Measure:* Award Local Food Certification to 20 retailers, restaurants, and cafeterias.

*Benchmark:* No current certification program

*Target:* Badge 8 businesses by the end of the project period

*Performance Monitoring:* The Spearfish Local Advisory Council will manage the certification process and will provide a quarterly report.

To reach new consumers, we have been marketing and advertising local food. With guidelines set by the Spearfish Local Advisory Council, we launched the Spearfish Local badge in December 2014. We are proud to say we now have 26 businesses registered for the badge.

## Goal #3:

Increase knowledge of local food for community members and visitors.

*Performance Measure:* 400 K-8 students (from Spearfish public schools) attend the educational program (in-kind), and 5,000 views of online "Know Your Farmer" videos.

*Benchmark:* No current education in the Spearfish public school district and no local online education opportunities.

*Target:* 400 K-8 students attend education program and 2,000 views of online videos by the end of the project period.

*Performance Monitoring:* Record student/teacher attendance at the educational programs and get a monthly report from YouTube and websites that host the videos.

During the grant period, we have worked with 540 Creekside Elementary Students (3<sup>rd</sup> and 4<sup>th</sup> grades) and we've brought 35 kids aged 4-12 on campus to attend our Sting's Eco Explorers day camp. Over 100 kids have attended the Sting's Eco-Explorers day camp. The youth projects we've done are all in-kind and do not involve direct grant expenditures.

We have filmed eleven videos featuring local businesses involved in producing or selling local food and began posting them through social media and showing them during events. YouTube counts the views at 708 total (as of November 1, 2017). We will continue to promote the videos and post them through other social media venues outside of YouTube, such as Facebook, so that the videos are easier to share.

We hosted an event, Spearfish Local Ice Cream Social, with over 100 attendees and placed two ads to reach new people.

We've presented at South Dakota Master Gardener State Update in 2016, Northern Hills Master Gardener and Dakota Rural Action meetings, and the SD Local Foods Conference in 2015 and 2017. In addition, we hosted a table at the Chamber of Commerce's Taste of Spearfish, Hills Horizon's SpearFest, Sturgis Bikes, Art, & Music Festival, Spearfish

Harvest Fest, Spearfish Downtown Friday Nights, BHSU Earth Day, Spearfish Farmer's Market and several BHSU campus events. We hand out stickers at all occasions with the Spearfish Local logo, which have become a popular sight on water bottles, computers, and bags across town.

Spearfish Local has been featured in articles in the Black Hills Pioneer, BHSU Jacket Journal, Facilities Manager magazine, and Rapid City Journal and an interview on South Dakota Public Radio. We had a two page spread in the Spearfish Chamber of Commerce's annual publication in 2016.

## **Beneficiaries**

This project aimed to benefit producers and businesses that sell local food and also community youth. We have 26 businesses under the Spearfish Local badge that benefit from free advertisement.

Because of the cafeteria analysis which led to the development of the Black Hills Food Hub, twenty farms benefited through sales as participants of the food hub. By September 29, 2017, the Black Hills Food Hub had made \$63,191.92 in sales to cafeterias in the Black Hills, a previously untapped market.

We worked with 540 Creekside Elementary students and over 100 kids in our summer programming, introducing them to gardening and activities around enjoying local food. Five BHSU students were directly involved in this grant's activities and an additional 12 students participated in local food programs at BHSU's sustainability office, providing them with experience relevant to their chosen fields.

## **Lessons Learned**

Through this project, we learned that the biggest barriers of local specialty crop consumption is cost and inconvenience. To promote behavior change for people and institutions to make the decision to purchase local food, we needed to make local food more accessible and something that people enjoy and find worthy of the extra effort to grow or purchase. When working with youth, we played games that explained what made local food special. The Spearfish Local badge was used to create a sense of pride around town for local food. Through the cafeteria analysis, we developed strategies to make purchasing local food easier for institutions, including the unexpected outcome of the creation of the Black Hills Food Hub.

Price is still an issue for many consumers and farmers cannot compete with large food distributors' prices at this time. By working with cafeterias, we hope to increase access to

populations who would normally not be able to choose where their food comes from or afford to purchase it themselves.

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## **Additional Information**

Our website is <http://www.BHSU.edu/SpearfishLocal>

## **PROJECT 4 (FINAL REPORT)**

**APPLICANT:** SOUTH DAKOTA DEPARTMENT OF HEALTH

**TITLE:** STRENGTHENING FRUIT & VEGETABLE INITIATIVES OF HEALTHY SOUTH DAKOTA

### **Project Summary**

National research on fruit and vegetable consumption patterns continually identify South Dakota as a state with low consumption percentages. Additionally, our state continues to be affected by a number of health conditions, including heart disease and cancer, which are greatly attributable to obesity. Overweight and obese South Dakota adults are slightly higher than the national median. According to the 2012 SD Behavioral Risk Factor Surveillance System (BRFSS), the prevalence of obese adults in SD was 28.1% as compared to the national median of 27.6%. The combined overweight and obese percentage for SD was 66%, compared to 63.4% nationwide.

In an effort to reverse this trend of poor fruit and vegetables intake and improve overweight and obese statistics, the South Dakota Department of Health Nutrition and Physical Activity Team (SD DOH NPA) focused goals and interventions that directly target or enhance fruit and

vegetable consumption across the state. These goals and interventions were streamlined from previous Specialty Crop Block Grant (SCBG) funding from 2011- 2013.

Results from the 2011 SCBG funded South Dakota research, helped streamline messaging, and assisted in action planning for fruit and vegetable promotion in South Dakota, specifically the action planning in the 2012 SCBG application. A result of the 2012 SCBG funding was the development of a fruit and vegetable stakeholder group. This group guided the activities and objectives executed in the 2013 SCBG application.

The 2014 SCBG project enhanced and expanded strategies and interventions within the 2012 and 2013 applications. Specific interventions for the 2014 year included revitalization and strengthening of efforts to continue to promote the YUM! social media campaign via Facebook and Pinterest, the Munch Code website and social media campaign via Facebook, and the continual support of the Harvest of the Month (HOM) website, educational program, and community partnerships. Additional fruit and vegetable promotion occurred through television and radio advertising, promotion and development of fruit and vegetable educational materials and providing schools and youth organizations with resources specific to locally grown fruits and vegetables. Enhancing previous interventions provided increased state wide visibility and influence, increased involvement from our statewide partners and continued promotion of consistent fruit and vegetable messaging.

Project Approach

The activities and tasks for the 2014 grant were carried out from June 2014 until May 2015. The DOH NPA team performed all activities outlined in the original application. In June and July the DOH NPA team convened to develop the framework and actions items for the *Strengthening Fruit & Vegetable Initiatives of Healthy South Dakota* project. In July and August the DOH NPA team prioritized interventions, determined an evaluation plan to monitor progress and measure outcomes, and communicated with key partners to move forward the project plan.

In early September, the DOH NPA team and our partners determined to enhance and move forward the interventions **listed below**. Primarily the focus for the project period was to enhance mass media messaging across the state, through social media, online resources and television ads.

<b>Project Activity</b>	<b>Intervention Reach</b>
YUM! Facebook Page	Page Reach: 2,542,383 Social Reach: 631,050 Paid Reach: 2,482,830
YUM! Pinterest Page	Profile Reach: 7,544 Audience Reach: 177,451
HOM Program	HOM Website Statistics

Enhancement	Visits: 17,258 Page Views: 24,106
Munch Code Facebook Campaign	Page Reach: 3,048,495 Social Reach: 590,174 Paid Reach: 2,998,071
Munch Code Website	Visits: 2,282 Page Views: 4,122
Fruit & Vegetable television ad	<b>East River South Dakota</b> Number of viewers: 272,500 Media impressions: 271,791,500  <b>West River South Dakota</b> Number of viewers: 104,800 Media impressions: 98,176,640

- Page Reach –defined as the number of people who have seen any content associated with the page
- Social Reach – defined as the number of people ad served to, including social interactions
- Paid Reach – defined as the number of people who saw an ad or sponsored story pointing to the page
- Profile Reach - defined as the number of average daily viewers of pins on Pinterest
- Audience Reach – defined as the average monthly viewers of pins
- Media Impressions – determined from August 2014 and April 2014 media flights

A few significant contributions to the success of this project were given from the HealthySD Stakeholders and the fruit and vegetable stakeholder group, which encompasses a large group of our statewide partners. Individuals from South Dakota Department of Education, SDSU Extension, Hot Pink Inc. Media, South Dakota Discovery Center, Sanford Health, Avera McKennan, Midwest Dairy Council, Live Well Sioux Falls, and the Alliance for a Healthier Generation contributed significantly to the success of the Harvest of the Month program enhancement and the statewide fruit and vegetable messaging. Further, individuals from Hot Pink Inc. Media, South Dakota Department of Education, City of Sioux Falls Park and Recreation, Alliance for a Healthier Generation, and SDSU Extension contributed to the success of the social media messaging, television ads and other fruit and vegetable media messaging.

SDSU extension expanded the HOM program to involve grocery stores and developed the *Pick it! Try it! Like it!* program. Their efforts enhanced and expanded messaging and programming on consuming fruit and vegetables and buying them locally. The South Dakota Discovery Center continues to offer training and implement the HOM program statewide. They continue to develop fruit and vegetable curriculum for early education, elementary and middle school settings, along with offering training and implementation. The South Dakota Discovery Center, Midwest Dairy Council, Alliance for a Healthier Generation, and Live Well Sioux Falls have been

key partners in promoting the program at various statewide conferences, conference breakout sessions, sponsorship of conference booths, and promotion of YUM!, HOM, and Munch Code campaigns through their organizations social media sites.

Through periodic conference calls, face-to-face meetings and our HealthySD Stakeholders bi-annual meetings, the DOH NPA team and our partners were able to coordinate and monitor the interventions of the project listed in the table above. The DOH NPA team and our partners continually work on fruit and vegetable specific interventions and messaging statewide. Through applicant matching funds, the fruit and vegetable interventions listed above, and some not listed, are continually implemented by the DOH NPA team and our partners.

Goals and Outcomes Achieved

Goal	Performance Measure	Benchmark	Target
Increase fruit intake to 28% & vegetable intake to 11%	BRFSS data	26.3% - fruit 9.4% - vegetables	South Dakotans

Outcome measures for this project (*shown in the table above*) were long term measures, the Behavior Risk Factor Surveillance System (BRFSS) was the planned performance measure source. According to 2013 BRFSS data, **26.4%** of South Dakota adults report consuming 2 or more fruits per day and **11.6%** report consuming 3 or more vegetables per day. Compared to our benchmark data from the 2011 BRFSS there was a minimal increase in fruit consumption (26.3% in 2011 to 26.4% in 2013) and a notable increase in vegetable consumption (9.4% in 2011 to 11.6% in 2013).

Based on the goals we listed for the project, the 2013 BRFSS data shows we fell short of increasing fruit consumption to 28%; however we did meet our goal of increasing vegetable consumption to 11%. Data from media interactions indicates shows the strong reach of our fruit and vegetable media messaging. This data is very positive, as we are reaching many individuals with our fruit and vegetable messaging and programming.

Data from the Youth Risk Behavior Survey (YRBS) assesses high school aged (grades 9<sup>th</sup>-12<sup>th</sup>) individuals and is not necessarily encompassing of the youth and adolescence potentially reached through this project, therefore data from the 2013 YRBS is not presented as a significant data source for our performance measures.

Beneficiaries

The target audience for the 2014 *Strengthening Fruit & Vegetable Initiatives of Healthy South Dakota* project was all South Dakotans, including youth, adolescents, adults and older adults. With social media and state-wide television and radio advertisement as the primary platforms, it allows the capability to reach all ages, populations, and genders. Individuals with easy access

to these media types may have seen greater benefit from these interventions. The data from the television advertisement shows a total of 377,300 viewers from all parts of the state. Facebook, Pinterest, and website statistics show a dramatic impact, such as over 3 million people saw content associated with Munch Code solely from the Munch Code Facebook page and just over 2.5 million saw content from the YUM! Facebook page.

The target audience for Harvest of the Month and Much Code is primarily youth and youth organizations. Thus, South Dakota youth may have also benefited greater from these interventions. As discussed above, data from the YRBS assesses high school aged individuals and is not necessarily encompassing of youth and

### Lessons Learned

Over the course of this project, the DOH NPA team was able to enhance current interventions and further foster and educate on the importance of consuming fruits and vegetables for a healthy lifestyle. Project activity statistics indicate social media has a strong presence in South Dakota, making us more successful to reach large percentages of the population. It is evident that continued enhancements and promotion of existing fruit and vegetable programs through media messaging will play a part in reversing the trend of poor fruit and vegetable consumption in South Dakota. Although we did not meet our goal for fruit consumption rates in South Dakota, we are pleased and encouraged by the increase in vegetable consumption achieved.

Through this grant we are continually reminded that partnerships with organizations throughout the state are vital to our efforts. With limited resources devoted to fruit and vegetable programs, partnerships are critical for successful messaging and interventions. We feel with a strong base of partners working together to promote fruit and vegetables and thus bringing more awareness to the topic, we are moving in the right direction. Improving fruit and vegetable consumption will continue to be a priority in our state and is evident from the objectives in the 2015-2020 South Dakota State Plan for Nutrition and Physical Activity to Prevent Obesity and Other Chronic Diseases.

### Contact Person

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### Additional Information

- YUM! Facebook Page: <https://www.facebook.com/YUMSD>

- YUM! Pinterest Page: <https://www.pinterest.com/yumsd/>
- Munch Code (Healthy Concessions) Facebook Page: <https://www.facebook.com/MunchCodeSD>
- Munch Code Website: <http://munchcode.org/>
- South Dakota Harvest of the Month: <http://www.sdharvestofthemonth.org/>
- HealthySD Website: [www.healthysd.gov](http://www.healthysd.gov)
- 2015-2020 South Dakota State Plan for Nutrition and Physical Activity to Prevent Obesity and Other Chronic Diseases <http://healthysd.gov/npa-state-plan/>

## **PROJECT 5 (FINAL)**

**APPLICANT: STEWART'S ARONIA ACRES FARM**

**TITLE: SOUTHEAST SOUTH DAKOTA HASKAP/HONEYBERRY FRUIT PRODUCTION VARIETY TRAILS**

### **Project Summary**

The primary purpose of the project was to document the methods and costs of establishment, management, survivability and fruit production of six promising varieties of haskaps in southeastern South Dakota. Other purposes were to cooperate with the SD Department of Agriculture, SDSU Extension Service, SD Specialty Producers Association and other partners in educating current and interested people in the health benefits, uses and products derived from haskaps.

This project was very timely in the fact that people, both young and old, are becoming very health conscious and many want to know how to grow, harvest and consume healthy fruit. Many also want to learn how to process and sell healthy fruit. Vitamin and mineral health related charts comparing haskaps with many other fruits were handed out at two tours. Over 100 people attended these tours in 2016 and 2017. A berry harvesting machine, harvesting

totes and walk in coolers were shown as a way to show how to harvest, store and care for fresh fruit.

## **Project Approach**

All grant related activities and tasks performed, down to the quarter hour, were recorded on a calendar and entered onto a spreadsheet. Planting, weeding, mowing, grass seeding, survivability percentages by haskap variety, rainfall received, tour related activities and many other tasks were entered onto quarterly spreadsheets and submitted as part of reports to the SD Department of Agriculture. Significant results include the high percentage of survivability of the haskap seedlings and the high attendance at the two tours. Unusual developments were the fact that the sixth haskap variety could not be secured. Since the planned sixth original variety could not be purchased even in year 3, two new varieties released by the University of Saskatchewan were planted instead. So a total of seven varieties instead of six were actually planted.

## **Goals and Outcomes Achieved**

Expected measurable outcomes were exceeded in two categories and not met in one category due to weather, age and size of plants.

Seven varieties of haskaps were planted instead of six. Five were planted in the first year of the grant and two varieties in year 3. This was due to variety availability. Survivability percentage by variety was charted and shared.

No haskap berries could be collected and weighted due to weather, age and size of the plants.

Two farm tours were held. One in 2016 and one in 2017 with slightly over 100 people officially registered.

Long term goals and records will be documented and kept for more years by variety and shared with whomever asks.

## **Beneficiaries**

Official registration was taken at each tour. People attended from the black hills area, the state of Nebraska, Minnesota and South Dakota. At least three farmers have told me they have since planted haskaps and many wineries have told me they are very interested in getting haskap berries for wine making. I have a good working relationship with SDSU personnel, SD

Department of Agriculture and SD Specialty Producers Association. They will be using me as a willing resource with people interested in haskaps.

### **Lessons Learned**

Insight was provided at each tour in growing and managing haskaps for commercial production. Some of this included; site preparation before planting is essential; weed control is essential; six-foot wide landscape fabric and planting grass between rows is necessary for weed and erosion control along with moisture conservation. Working with businesses in a foreign country like Canada can be frustrating because of the currency exchange rate, and their lack of timeliness in delivering seedlings in a timely manner.

### **Contact Person**

Stewart's Aronia Acres business cards were handed out at each tour. These included phone numbers and the email address. Tour attendees were encouraged to join the SD Specialty Producers Association and were informed about the SD Department of Agriculture Specialty Block Grant Program.

## **PROJECT 6 (FINAL)**

**APPLICANT: SOUTH DAKOTA DEPARTMENT OF AGRICULTURE**

**TITLE: 2015 SOUTH DAKOTA STATE FAIR WINE PAVILION**

### **Project Summary**

The South Dakota Department of Agriculture along with the South Dakota wine industry hosted the SD Wine Pavilion at the 2015 SD State Fair. This is the eighth year we have held a wine pavilion at the State Fair. It has been very successful based on the number of people attending the wine pavilion and tasting South Dakota wines . We used Facebook and have over 50 followers.

### **Project Approach**

SDDA hired a contractor to plan the wine pavilion, including contacting wineries, hiring staff, promoting the event, etc. SDDA and the event contractor hold regular conference calls to keep the project on track. The contractor is responsible for hiring staff, ascertaining any required licenses, providing financial accounting and inventory systems, and working with the wineries to discuss participation and available wines.

SDDA provides oversight and approval of contractor's activities.

The wine pavilion took place during the South Dakota State Fair on Sept. 5-7, 2015. Eleven South Dakota wineries participated in the five day event. The event is set up so that consumers can sample a variety of South Dakota wines. We had 33 varieties of wine available and had all of them available every day for consumers to sample. We had five regular tasting stations set up – each one featuring a different type of wine (red, sweet red, white and 2 fruit stations). Professional staff describe and sample the wine to consumers.

We also partnered with various commodity organizations to pair the wine with South Dakota food including beef, pork, turkey, cheese and lamb. We made an increased effort to pair wine with South Dakota cheese. All food paired with the wine was donated by various commodity groups, organizations and businesses. All food paired with the wine was donated and no Specialty Crop Block Grant funds were used for purchasing food.

Once consumers sample the wine, there is a retail area where they can purchase wines by the glass to enjoy in the wine garden; or they can purchase a bottle of wine to take home with them.

We had over 4,000 people visit the wine pavilion and sample SD wine. We counted people by the number of tasting tickets that were purchased. There were certainly other people who walked through the wine pavilion but did not sample wine. We do not have an accurate way to count those people.

The wines at the event represented the following specialty crops: grapes, aronia berries, cherries, crab apples, rhubarb, raspberries, apples, black currants, strawberries, cranberries, honey, and peaches.

#### **Goals and Outcomes Achieved**

- 95% Percent of the people that attended the Wine Pavilion gained knowledge about SD Wines, wineries, local foods, and breweries.

#### **Beneficiaries**

With the exposure that the local businesses such as the wineries, breweries, are get during that Wine Pavilion, they draw in business that they would never be able to hit otherwise. The wine Pavilion represents the following specialty crops: grapes, aronia berries, cherries, crab apples, rhubarb, raspberries, apples, black currants, strawberries, cranberries, honey, and peaches.

#### **Lessons Learned**

Every year, we learn more about how we'd like to expand the Wine Pavilion in the future. With the transition of the project to the South Dakota Wine Growers Association, 2015 was a transition year. More learning to come for the new Project Coordinators to come. With a strong contractor that they plan on continuing to work with, we believe that the Wine Pavilion will continue to be strong.

#### **Contact Person**

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## **PROJECT 7 (FINAL)**

**APPLICANT: SOUTH DAKOTA STATE UNIVERSITY**

**TITLE: THE USE OF CONSERVATION STRIPS FOR INCREASING BENEFICIAL INSECTS AND DECREASING PLANT PESTS IN PUMPKIN PLANTINGS**

### **FINAL REPORT**

**Project Title: The Use of Conservation Strips for Increasing Beneficial Insects and Decreasing Plant Pests in Pumpkin Plantings.**

**Project Summary:** Cucurbit crops, including muskmelon, watermelon, cucumbers, squash, pumpkins, and gourds, comprise a small but significant industry in South Dakota with 626 acres of reported commercial production (2007 Census of Agriculture), with an estimated contribution of nearly \$3 million to the state's economy. Crop failures due to insects, or insect-transmitted diseases, pose a threat to cucurbit producers across the state. Insect pests in cucurbits can be difficult to control as there is often only a brief window of opportunity. Beneficial insects such as pollinators and predators are declining for many reasons including conventional spraying practices and habitat loss.

Planting strategically designed, diverse conservations strips around cucurbit crops may provide a benefit both by decreasing pests by acting as a trap crop or confusing pests, and by increasing beneficial insects by providing food sources and habitat.

Economic benefits to producers who utilize our research could include reduced input costs associated with pesticides (trap crops and increased predation could reduce pesticide use) and through increased yields associated with enhanced pollinator communities. Consumers and residents would also benefit by having less exposure to pesticides.

**Project Approach:** "Howard" pumpkins were planted in plots with/without perimeter pollinator strips and with/without Hubbard trap crop strips, monitored for insect activity and harvested at two locations in 2015: NE Hansen research farm near Brookings, and on a private farm near White, SD. The pollinator strips consisted of a mix of 12 wild and domestic species chosen to provide flowers throughout the season.

- Squash borer presence and damage was recorded every two days for five weeks, until there was no further signs of the borer or injury.
- Sweep nets were used to collect insects present in the perimeter areas; they were then identified to family, and recorded. A number of predator insect species were collected in the pollinator strips
- All fruit in each plot were harvested, with numbers and weights recorded.

- Data from the experimental plantings was analyzed and written up in a M.S. thesis, available at <http://openprairie.sdstate.edu/etd/1191/>
- Results from this study were presented at the Great Plains Growers Conference in St. Joseph, MO, Jan. 2017. This project also supported the graduate student who carried out the research, and who is now sharing the knowledge gained with students at the Local Foods Education Center.

#### Goals and Outcomes Achieved:

The impact of combined trap crops/conservation strips on the presence and functions of beneficial insects and insect pests on cucurbit crops (pumpkins) in South Dakota was evaluated in test plots.

- 1) Goal: Increase beneficial insect populations and their services. Result: Greater numbers of most insect orders were found in pollinator strip treatments compared to bare ground. Soldier beetles in particular showed increases in the pollinator vs. pollinator + trap crop treatments; conversely more parasitoid wasps were found in the pollinator strips that also contained trap crops. Differences between pollinator numbers were not significant between the two types of pollinator strips.
- 2) Goal: Increase fruit set. Result: The **pollinator plant strips, with or without trap crops, increased fruit numbers** by about 50% over the two locations. The presence of trap crops also increased fruit number significantly over pollinator strips without trap crops in both locations. Similar effects were noted with fruit weight, with weight increasing almost 90% over the two locations.
- 3) Goal: Decrease/distract key pumpkin pests from the cash crop using trap crops of preferred squash varieties. Result: The presence of **a trap crop in the pollinator strips greatly reduced squash vine borer** presence and damage in the pumpkin plots. Pollinator strips without trap crops had no effect on the borer presence in the crop.

**Beneficiaries:** While this was a limited study, it demonstrates that a technique (trap crops) used in other parts of the country will likely work in South Dakota as well. This integrated pest management technique will benefit organic and conventional growers, providing an effective method for reducing vine borers without pesticides, which are costly and often not effective. The study shows there could be a potential increase of \$1 million or more in yields of pumpkins in South Dakota with use of the trap crop. The presence of the pollinator crop may have additional benefits, but needs further fine-tuning. However, we encourage growers to consider planting pollinator strips (which may have the added benefit of providing some windbreak) to bloom before and during the bloom period of the cucurbit crop.

#### Lessons Learned

- Plots were planted in 2014, but were destroyed by prolonged rains. Better location selection might have avoided this issue, although the spring was unusually wet.
- It would have been better to sample the insects in the pumpkin plots rather than the surrounding strips, in order to get a better understanding of pollinator and predator behavior.

- We were unable to set up a field day for growers during the grant period. We intend to host an open house at the Local Foods Education Center on campus in 2018, and offer training on basic insect identification, focusing on pollinator and predator insects, as well as cucurbit pests.

Submitted by: Dr. Rhoda Burrows, South Dakota State University  
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## **PROJECT 8 (FINAL)**

**APPLICANT: SOUTH DAKOTA SPECIALTY PRODUCERS ASSOCIATION (SDSPA)**

**TITLE: STATEWIDE SPECIALTY CROP GROWING LOCAL PRODUCTION SEMINAR**

### **Project Summary**

Multiple organizations across the state are committed to helping growers gain information and resources to improve specialty crop quality, consumer safety and to increase the number of farmers markets in our rural communities. A majority of this information is currently provided on an individual basis through direct contact with the resource or as part of localized specialty crop/local foods meetings. These are obviously effective avenues but can lack a comprehensive scope and access to expertise.

Discovery meetings held across the state during winter 2010 and spring of 2011 found growers yearning for production training, business training and expanded markets for their product. Partnering organizations are also exploring the potential to regionalize aggregation of production, processing, packaging, marketing and distribution using the cooperative model as part of South Dakota's local food systems. Still other entities are working with growers, various garden types, processing and diverse marketing avenues. Strategy to increase awareness and bring small, medium and large growers and buyers together is essential to building a comprehensive food system initiative.

### **How is this project important and timely?**

Local food systems create more area based, self-reliant food economies yet an estimated 97% of the food consumed in the Midwest is imported with a majority of it traveling about 1500 miles to reach our table. Gross food expenditures range from \$433 million in Sioux Falls to \$315 million in Rapid City to \$74 million in Huron. Local foods can take a portion of that food dollar allowing enhanced economies for our rural communities from the turnover of dollars from production to sales of specialty foods. Consumer food purchasing decisions are mainly influenced by price/convenience/flavor/health-safety. With calculated planning and strategic implementation of goals, local foods can satisfy these consumer desires.

SDSPA formed in 2002 as an organized effort to help producers tap into this emerging market opportunity and the member base represents a wide range of specialty crops and products

across the state. The association's main focus has been obtaining funds to hold specialty crop producer workshops and marketing projects, including producer inventories and "Buy Fresh Buy Local" South Dakota chapter sponsorship. SDSPA is dedicated to providing the highest levels of grower education and support to promote consumer safety and market expansion for their specialty crop products. Holding a statewide Growing Local seminar in Huron during Value-Added Day at the South Dakota State Fair offers a platform to attract regional growers and resources which can result in diversified views helpful in building our statewide local food system.

- An essential step to establishing an annual event that can effectively grow to help address challenges as South Dakota's local foods programs advance.
- Effectively serve needs of growers, food processors, and buyers by creating collaborative efforts to develop and share resources including information, infrastructure, funding.
- Foster grower relations from various regions to address foodshed development.
- Provide a platform for public and youth awareness of local food offerings.
- Industry associations could also hold meetings/trainings in conjunction with the SDSPA seminar as many are present at the State Fair.

Hosting a training seminar expands opportunity to identify resources and gain knowledge from industry leaders. And a statewide seminar will build new or expand existing education programs, training and production initiatives aimed at improving specialty food production, business planning and marketing. Possible topic areas include:

- Production – crop selection and management, high tunnels, GAP, 3rd party verification
- Operating – business planning, bank financing, insurance, combining production-processing resources
- Market – branding-promotion, analysis, connections, pricing, volume sales, distribution
- Processing – SD regulations, commercial kitchens
- Buyers – identifying quality produce, grower criteria-pricing education, distribution

### **Project Approach**

Preliminary meetings were held with SD Specialty Producer Association executive committee in July and August to determine topics for the seminar. The intent was to provide topics to increase production skills. The committee selected the topics and Patrick Garrity made the arrangements for the presenters. We developed an "open house" theme to showcase six South Dakota producers. The producers were Valiant Winery, Prairie Coteau, Prairie Moon Herbs, Bizzy Lizzy, Hebda Produce and Stewarts Aronia Acres. Each producer displayed a banner showcasing the products and activities at the farm. Each producer was available to discuss details and lessons from their operation.

Promotion was provided by SD Value-Added Development Center in state-wide PSA announcements throughout South Dakota. The promotion efforts began early August for the August 28 event.

South Dakota Specialty Producers Association also provided an informational booth to promote specialty crops and production information at the seminar.

The following agenda was submitted to various website connections and other social media.

The SD State Fair also published the agenda on the fair program. The agenda was also

submitted to agricultural radio stations.

South Dakota State Fair  
Value Added Agriculture Development Center / South Dakota Specialty Crop Association  
Specialty Crop Production Seminar

7:00 AM 9:00 AM

Setup time and remove vehicles

9:00 AM to 3:00 PM

Producers present at display area, offer discussion and lessons on production and marketing. Producers also offer produce and product for sale.

4:00 PM to 5:00 PM

Serve South Dakota State University ice cream, social hour, promote South Dakota Specialty Crop Association.

**Goals and Outcomes Achieved**

<b>Goal</b>	<b>Performance Measure</b>	<b>Benchmark</b>	<b>Target</b>	<b>Actual</b>
Invite growers to conference	Number of grower participants	10	15	34
Invite resources to conference	Number of resource exhibits	18	20	18
Provide message to consumers at conference	Number of consumers reached	35	45	113

**Beneficiaries**

The participating producers were able to promote the specialty crop industry with the well displayed presentations. Many attendees were impressed with the type of produce and products made in South Dakota. Several people were interested in garlic production and gave very favorable comments about Prairie Coteau garlic farm. Many individuals were interested in wine production and everyone enjoys wine tasting with Valiant Winery.

The topics / lessons provided were marketing issues like sources for product labels, proper display methods for farmers markets and exploring the food hub distribution option.

The production discussions were proper soil nutrition, cultivar selections, harvesting methods, creating a bakery on the farm and post harvest methods.

**Lessons Learned**

The seminar was intended to provide a statewide meeting place for specialty crop producers. The state fair should be a natural location to provide educational programs as it lends itself to other activities to make a worthwhile effort to attend. At the 2014 State Fair, the seminar had many attendees but they were not interested in a formal environment. The 2015 State Fair was an "open house" arrangement. This provides a relaxed environment and many attendees

became very engaged with the producers and their operations. The producers also provided large displays of produce and product. This provided a showcase for South Dakota products and was good publicity for South Dakota Specialty Producers Association.

#### **Contact Person**

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## **PROJECT 9 (FINAL)**

**APPLICANT: DAKOTA HOPS, LLC**

**TITLE: MARKETING AND PROMOTING HOPS IN SOUTH DAKOTA**

### **Final Report**

**Project Summary:** The purpose of this grant is to examine freeze drying as a method to preserve hops for the brewing industry and represents the third and final phase of a study of alternative methods of preserving hops by freezing.

**Project Approach:** The first two phases of this study looked at mechanical (conventional) freezing and cryogenical freezing to preserve hops, compared to preserving hops by drying them in a dry kiln, the current commercial accepted method. There is a total lack of data about using frozen hops and freeze dried hops in brewing. We do expect the brewing trials to provide useful information on the similarities/differences of beer brewed with frozen hops and dried hops, as well as the development of new recipes.

**Goals and Outcomes Achieved:** Freeze drying is a preservation process that uses freezing to produce a dehydrated product and was therefore included in our hop preservation study, although we did not know if it was possible to freeze dry hops. To accomplish this phase of the study we worked with Dr. Padmanaban G Krishnan, Food Services Department South Dakota State University who successfully completed the freeze drying trial of Cascade hops harvested from one of our hop yards in western South

Dakota. His findings are included in this report. Brewing trials using freeze dried hops were not part of this study but will be incorporated in the brewing trials currently underway with mechanical and cryogenically frozen hops.

After two and a half years of brewing trials conducted by craft brewers (homebrewers and microbrewers) who brewed and compared beer brewed with both frozen and commercially dried hops the preliminary results were very uniform beer brewed with frozen hops had more aroma and flavor than beer brewed with dried hops. As a result, we are continuing the brewing designed for research and limited commercial production using hops harvested in 2015 and 2016 from our hop test plots; processed by grinding and compacting; and, frozen either mechanically or cryogenically at temperatures of -0 degrees Fahrenheit to -120 degrees Fahrenheit. After the 2017 harvest we plan to test frozen hops against dried hops produced from the same hop field as the frozen hops.

### **Report compiled by Padu Krishnan**

The purpose of this project was to demonstrate Proof of Concept for efficient moisture removal from hops employing a freeze drying technique.

Approximately 4 kilograms (3836 g) of frozen and compressed hops were optimized for freeze drying using a Labconco Shelf Freeze Dryer. Equipment conditions were optimized for condenser temperature, shelf temperature, vacuum conditions, and length of instrument operation.

The freeze dryer was sterilized using bleach solution in order to yield a wholesome food grade freeze dried hops.

Compressed freeze dried hops were placed on stainless steel wire shelves to ensure efficient moisture migration and removal from the product. Freeze drying was conducted in 4 batches.

Freeze dried hops yielded an average  $A_w$  of 0.085 indicating good stability. Samples were left in a freezer however to preserve organoleptic qualities.

FD Hops weighed 33.93% of the original weight indicating fresh hops contained 66.1% free water. Recovery of dried hops was 1217 g. Yield was 31.7%.

Table 1. Batch process freeze drying and final  $A_w$  reached at ambient temperature

# Results

Product	Aw	Temperature (C)
Non Freeze-dried Hops	0.982	26.3
	0.978	26.7
Freeze-dried Hops	0.099	25.8
	0.070	26.0
	0.100	26.5
	0.072	26.6

Conclusion: Hops was successfully freeze dried to moisture levels of less than 5%. A 4 Kg batch of hops can be processed in 5 days to an appreciable Water Activity level. Freeze drying employs both vacuum and heat treatments. Retention of volatile and aromatic compounds may be evaluated by sensory techniques.



Figure 1. Shelf freeze dryer.



Figure 2. Hops – As Is Hops and Freeze Dried Hops showing color contrast and friability.



Figure 3. Freeze Dried Hops.



Figure 4. Water Activity determination employing a chilled mirror Aw Instrument.

Selected references:

<http://www.keloland.com/newsdetail.cfm/growing-hops-in-south-dakota/?id=117551>

[http://www.nass.usda.gov/Statistics\\_by\\_State/Regional\\_Office/Northwest/includes/Publications/Hops/hops\\_12.pdf](http://www.nass.usda.gov/Statistics_by_State/Regional_Office/Northwest/includes/Publications/Hops/hops_12.pdf)

<http://www.acne.org/messageboard/topic/216975-5-year-bumps-on-nose/>

**Beneficiaries:** We hope to complete the licensing process in 2017 and begin production of beer brewed with frozen hops which will move forward efforts of the Sick and Twisted Brewery in Hill City, South Dakota who in 2015 brewed and sold beer brewed with our frozen hops.

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## **PROJECT 10 (FINAL)**

**APPLICANT: SOUTH DAKOTA STATE UNIVERSITY CHEYENNE RIVER EXTENSION**

**TITLE: CANPA AWAKU (BRINGING BACK THE CHOKECHERRY)**

***Gilbert-FPT SDDA-Canpa Awaku***

South Dakota Department of Agriculture  
Specialty Crop Block Grant Program

Marcella Gilbert

3M5648

Final Performance Report

January 25, 2018

**Project Title: Canpa Awaku (Bringing Back the Chokecherry)**

### **Project Summary**

On the Cheyenne River Indian Reservation, the cultural knowledge about Indigenous foods is rapidly decreasing among the youth. Cultural food knowledge related to historical food practices in wild food identification, preparation, preservation, and use is not being passed down from elderly and adult members to the youth of the reservation.

The Chokecherry Project is a youth revitalization project focused on providing local youth with hands-on experiences in learning the cultural and scientific knowledge related to the wild chokecherry. The purpose is:

- “ To revitalize cultural knowledge related to wild native foods particularly the chokecherry
- “ To engage 50 or more youth in this 2yr revitalization project
- “ To promote the protection of and use of the chokecherry among youth and their families
- “ To understand the landscape of the chokecherry habitat through soil and plant science
- “ To create a chokecherry orchard within two years that is accessible to the community
- “ To encourage value-added products at the local farmer’s market.

## Project Approach

The Canpa Awaku project focuses on the revitalization of the chokecherry plant among youth on the Cheyenne River Indian reservation in South Dakota. Cultural education will be provided by local elders through the Cheyenne River Sioux Tribe (CRST) Elderly Nutrition Center and local traditional food experts, along with SDSU specialists who will provide a well-rounded curriculum that is scientifically based, addressing areas such as soil and plant health, geographic location significance, seasonal growth patterns, and nutritional value.

Local tribal members will assist youth in the traditional preparation, preservation, medicinal usage, and holistic methodologies of the chokecherry. Up to seven or more reservation community centers will provide access to kitchen use for preservation sessions. Marketing education will be provided by Four Bands Community Fund in order to encourage youth in areas of entrepreneurship.

Chokecherry revitalization will occur through identifying existing/former sites for chokecherry production and replanting in former or under-producing sites.

A second-year pilot project focused on transplanting in a domesticated orchard setting located on land maintained by CRST Cultural Preservation program to increase access and availability of the traditional crop to all tribal members will be implemented to enhance project sustainability, nutrition education, preservation methods, and entrepreneurship opportunities for youth living on the reservation and surrounding rural areas. The CRST Oyate Connections, tribal employment and training program, will be utilized to provide an orchard manager during the summer months of June, July, and August.

After recruiting youth, the first step involved identifying locations of current chokecherry bushes and introduce them to the youth. One location resides on the outskirts of a neighborhood in Eagle Butte SD that is a few miles from the city landfill. As a result of the location, the area around the neighborhood sometimes get littered with trash blowing from the landfill. Our project was able to recruit youth from the children's home and plan a field trip to clean up around the chokecherry bushes. Nineteen bags of trash from this area were picked up and the youth were inspired to

return and finish the job when the weather permitted. As youth were working, we found that wild currant and boxelder maple also reside alongside the chokecherry bushes.

First year (2015) accomplishments include the following:

#### Jan-Mar

- Recruited 46 youth for the Specialty Crop chokecherry project-21 girls, 25 boys
- Traditional foods presentations at various local programs and groups-13 adults; 9 youth

#### Apr-Jun

- Earth Day activity in collaboration with the Children's Home, 15 youth picked up trash surrounding a wild chokecherry orchard-7 boys, 8 girls, 3 adults
- Completed 5 Pick It, Try It, Like It cards focusing on chokecherry and prairie turnip recipes; collaborated with Karlys Wells, EFNEP & SNAP/ED, Team Nutrition Associate
- Participated as a panelist presenter at the SDIBA conference in Deadwood SD. Topic was BFRDP/Specialty Crop grants, and Indian ag. @15 ppl in attendance.
- Provided a traditional foods presentation to 63 tribal elderly-39 women, 25 men; collaboration with the tribal Wisdom Keepers elderly program.
- Wellness Conference presentation in Eagle Butte on May 27<sup>th</sup> to local community members about native foods and traditional diets related to the current diabetes epidemic in Indian Country.

#### Jul-Sept

- Collaboration with Simply Smiles in Laplant to implement a traditional foods presentation including an outing to identify wild foods such as chokecherry; 18 adults; 8 youth; Linda Black Elk, ethnobotanist from Sitting Bull College provided insight into plant knowledge.

- Indigenous Foods & Skills Festival; 62 adults; 42 youth (52-AF; 10-AM) (12-YF; 10-YM); 6 adult women-cookoff; 7 adult women-cut raw meat for drying; 7 women-canning chokecherry jam; 24 women-making chokecherry cough syrup; Linda Black Elk provided the cough syrup workshop, Janie Ducheneaux provided the canning session.

#### Oct-Dec

- Chokecherry workshops in the Cheyenne Eagle Butte high school-35 youth; 3 adults; included information sharing with students about the medicinal, spiritual, cultural, nutritional, and scientific value of the chokecherry. Students learned how to crush and dry chokecherries as a cultural food preservation technique and also learned how to can jam and jelly from chokecherries and wild plums.

The second year (2016) accomplishments included:

#### Jan-Mar 2016

- Meeting with tribal land committee to discuss a local community chokecherry orchard-11 adults
- Chokecherry project at Tiospaye Topa School (TTS) in LaPlant South Dakota-33 youth, 6 adults; workshop included information sharing with students about the medicinal, spiritual, cultural, nutritional, and scientific value of the chokecherry. Students learned how to make chokecherry cough syrup.
- Chokecherry project at Cheyenne Eagle Butte (CEB) high school-14 youth, 2 adults; a repeat workshop session of Oct.-Dec. as above
- Traditional foods presentation and wild foods assessment at the Research Summit sponsored by Missouri Breaks- 15 adults

#### Apr-Jun 2016

- Chokecherry tree planting activity-12 adults, 8 youth;
- Two chokecherry cough syrup presentations at the SiouxYMCA Marrowbone Camp – 34 youth, 13 adults;

#### Jul-Sept 2016

- Contact made to Dupree School to set up a chokecherry workshop

#### Oct-Dec 2016

- Provided a chokecherry workshop to 4<sup>th</sup> - 12<sup>th</sup> grades at Dupree School that included information about traditional foods, the medicinal, spiritual, cultural, nutritional, and scientific value of the chokecherry, and how to make chokecherry cough syrup;

The final year (2017) accomplishments included:

#### Jan-Mar 2017

- Provided an adjusted budget to expend remaining funds in the Chokecherry Specialty crop grant by the end of 2017.
- Contacted Arlen Lee at Oyate Connections to set up a date and time for a training for their summer youth employment staff. Training to include an introduction to the chokecherry orchard and its origin and care.
- Conducted two separate visits to the orchard to assess current needs. The dripline seems to have survived the winter and is still functional. Certain tools that were on loan from

the Prairie Management program are missing, a 3lb mallet and large metal staples will need to be replaced.

#### Apr-Jun 2017

- Made two visits to the orchard and met with a veteran volunteer who decided to manage the orchard and put in a large garden in collaboration with the Cheyenne River Sioux Tribe Elderly Nutrition Center. Mr. O'Hanlon put in a large garden and cared for the orchard until mid-June.
- Communication with Oyate Connections director, Arlen Lee resulted in a training on June 12<sup>th</sup> with all of the current summer youth participants and their parents, and staff, approximately 50 persons in attendance. A discussion with the Oyate Connections director revealed that their program could not support a summer orchard manager due to insurance issues. The Extension program would have to consider providing insurance for an orchard manager through the Oyate Connections summer employment program. Therefore, Oyate Connections cannot afford to support an orchard manager for the SDSU Extension chokecherry community orchard.

#### Jul-Sept 2017

- On August 1<sup>st</sup>, Marcella Gilbert led a group of three youth and seven adults on a field trip to harvest wild chokecherries. On August 2<sup>nd</sup>, a chokecherry canning session took place in LaPlant with the Simply Smiles youth and adult summer nutrition classes, eight youth and eight adults in attendance. Marcella Gilbert conducted a class in wild foods and native health and Janie Ducheneaux conducted the canning activity.
- On August 3<sup>rd</sup>, a workshop led by Marcella Gilbert on making wild chokecherry cough syrup took place at Simply Smiles with eighteen adults and five youth.

- August 4<sup>th</sup>, the chokecherry jam and cough syrup were part of the inventory of the Simply Smiles roadside food stand managed by local youth and program interns.

### Goals and Outcomes Achieved

The Goal, Benchmark, and Target as indicated in the grant proposal were achieved through pre and post-tests:

#### Goals:

1. Youth gain cultural awareness and engagement
2. Youth gain basic scientific knowledge of chokecherry habitat
3. Increased access to local food
4. Increase in knowledge gained in entrepreneurship possibilities
5. Sustainable chokecherry orchard accessible to youth
6. Orchard management training

#### Benchmark:

1. <10% knowledge of chokecherry use among youth
2. <10% scientific knowledge
3. <10% overall access to chokecherry source
4. <10% marketing and vending at local farmer's market

#### Target:

1. >50% knowledge gained among youth
2. >50% scientific knowledge gained
3. >50% overall gain access to local food
4. >10% participation at local farmer's market and other vending possibilities

Thirty-one (31) workshops/presentations focused on wild native foods, nutrition, food preservation, and plant identification took place in three (3) schools and five (5) programs, events, or other educational opportunities.

Workshop/presentation attendees: 111 adults; 530 youth

Pre and post-tests complete: 179                      incomplete: 351

### Beneficiaries

Partnerships included three (3) local reservation schools located in Eagle Butte, Dupree, and LaPlant. Educators from the Lakota language classes, family and consumer science classes, and school cultural programs provided access into classrooms. The CRST Cultural Preservation office, Missouri Breaks research project, and local tribal experts provided cultural and spiritual knowledge about the value of the chokecherry plant. The Sacred Heart Children's Home in Eagle Butte, the Simply Smiles summer youth program in LaPlant, and the SiouxYMCA in Dupree provided space and access to the youth for workshops, presentations, and plant identification field trips. The CRST Elderly Nutrition program offered garden space to plant 400 chokecherry trees.

### Lessons Learned

Accessing youth during the summer months proved to be a challenge. Adjustments included focusing on the schools in the fall in order to provide insight into the chokecherry workshops since the chokecherry ripened in August. Youth were in school when preserving methods were being taught and farmer's markets were not available. Regular preservation classes are needed to encourage preparedness and participation in farmer's markets in the future. The summer youth programs provided excellent access to youth for plant identification field trips.

Weather played a role in summer outings and planting trees, some days were too hot, others were too wet.

Timing became a challenge when working with educators in the school systems, their tight schedules determined what part of the presentations would be provided and how many workshops or outings were manageable. This also played a role in whether or not post-tests were given to students and/or returned to the project.

Projected partnership with the local tribal youth employment program did not work therefore there was not ever an orchard manager in place. This is a need for the future of the orchard.

A method of evaluation to determine knowledge gained from the pre and post-tests is needed. A simple observation of these tools could determine that more than fifty youth gained valuable knowledge about the chokecherry plant and its value.

### Contact Person

Marcella Gilbert, email: [marcella.gilbert@sdstate.edu](mailto:marcella.gilbert@sdstate.edu); ph: 605/964.4955

PO Box 223 Eagle Butte, SD 57625

### Additional Information

Grant coordinator of this project left Extension in August 2016 and has returned on a part time basis in October 2017 through April 2018. Therefore, completion plans include:

- A sign will be installed that reflects the collaborations and efforts of all programs supporting the Eagle Butte Extension office in implementation of the community chokecherry orchard.
- The irrigation system will be evaluated a second time and adjustments and repairs will be made.
- Community awareness will continue about the origin, location, and opportunities to the community as a result of a local community chokecherry orchard located in the middle of their town.

### Project Annual Reports 2015-2017

After recruiting youth, the first step is to identify locations of current chokecherry bushes and introduce them to the youth. One location resides on the outskirts of a neighborhood in Eagle Butte SD that is a few miles from the city landfill. As a result of the location, the area around the neighborhood sometimes get littered with trash blowing from the landfill. Our project was able to recruit youth from the children's home and plan a field trip to clean up around the chokecherry bushes. These pictures represent before and after the cleanup.





After 1 ½ hours...



There were still some trash deep inside the bushes but we managed to pickup 19 bags of trash from this area and the youth are inspired to return and finish the job when the weather permits. As youth were working, they were also becoming interested in what kind of other plants were living there. We found that wild currant and boxelder maple also reside alongside the chokecherry bushes.



### Annual Rpt-2015

#### Jan-Mar

- Recruited 46 youth for the Specialty Crop chokecherry project-21 girls, 25 boys
- Traditional foods presentations-13 adults; 9 youth

#### Apr-Jun

- Earth Day activity in collaboration with the Children's Home, 15 youth picked up trash surrounding a chokecherry orchard-7 boys, 8 girls, 3 adults
- Completed 5 Pick It, Try It, Like It cards focusing on chokecherry and prairie turnip recipes
- Participated as a panelist presenter at the SDIBA conference in Deadwood SD. Topic was BFRDP/Specialty Crop grants, and Indian ag. @15 ppl in attendance.
- Provided a traditional foods presentation to 63 tribal elderly-39 women, 25 men; collaboration with the tribal Wisdom Keepers elderly program.
- Wellness Conference presentation in Eagle Butte on May 27<sup>th</sup> to local community members about native foods and traditional diets related to the current diabetes epidemic in Indian Country.



## Jul-Sept

- Collaboration with Simply Smiles in Laplant to implement a traditional foods presentation including an outing to identify wild foods such as chokecherry; 18 adults; 8 youth; an ethnobotanist, Linda Black Elk, from Sitting Bull College provided insight into plant knowledge.



- Indigenous Foods & Skills Festival; 62 adults; 42 youth (52-AF; 10-AM) (12-YF; 10-YM); 6 adult women-cookoff; 7 adult women-cut raw meat for drying; 7 women-canning chokecherry jam; 24 women-making chokecherry cough syrup; Linda Black Elk provided the cough syrup workshop, Janie Ducheneaux provided the canning session.



## Oct-Dec

- Chokecherry workshop in the CEB high school-35 youth; 3 adults; included information sharing with students about the medicinal, spiritual, cultural, nutritional, and scientific value of the chokecherry. Students learned how to crush and dry chokecherries as a cultural food preservation technique and also learned how to can jam and jelly from chokecherries and wild plums.



### Annual Report 2016

Jan-Mar 2016

- Meeting with tribal land committee to discuss a chokecherry orchard-11 adults
- Chokecherry project at Tiospaye Topa School (TTS) in LaPlant South Dakota-33 youth, 6 adults; workshop included information sharing with students about the medicinal, spiritual, cultural, nutritional, and scientific value of the chokecherry. Students learned how to make chokecherry cough syrup.



- Chokecherry project at Cheyenne Eagle Butte (CEB) high school-14 youth, 2 adults; included information sharing with students about the medicinal, spiritual, cultural,

nutritional, and scientific value of the chokecherry. Students learned how to crush and dry chokecherries as a cultural food preservation technique and also learned how to can jam and jelly from chokecherries and wild plums.

- Traditional foods presentation and wild foods assessment at the Research Summit sponsored by Missouri Breaks- 15 adults

Apr-Jun 2016

- Chokecherry tree planting activity-12 adults, 8 youth;



- Two chokecherry cough syrup presentations at the SiouxYMCA Marrowbone Camp – 34 youth, 13 adults;

Jul-Sept 2016

- Contact made to Dupree School to set up a chokecherry workshop

Oct-Dec 2016

- Provided a chokecherry workshop to 4<sup>th</sup> - 12<sup>th</sup> grades at Dupree School that included information about traditional foods, the medicinal, spiritual, cultural, nutritional, and scientific value of the chokecherry, and how to make chokecherry cough syrup;

### Annual Report 2017

#### Jan-Mar 2017

- Provided an adjusted budget to expend remaining funds in the Chokecherry Specialty crop grant by the end of 2017. Emailed to Diana Charles for further distribution.
- Contacted Arlen Lee at Oyate Connections to set up a date and time for a training for their summer youth employment staff. Training to include an introduction to the chokecherry orchard and its origin and care.
- Conducted two separate visits to the orchard to assess it's needs. The dripline seems to have survived the winter and is still functional. Certain tools that were on loan from the Prairie Management program are missing, a 3lb mallet and large metal staples will need to be replaced.
- Conducted several phone conversations with Diana Charles about the water bill at the CRST Elderly Nutrition Center, SDSU Extension paid part of the water bill for the summer of 2016 for the orchard. A current assessment of the water billing over the winter (off season months) requires further evaluation.

#### Apr-Jun 2017

- Made two visits to the orchard and met with a veteran volunteer who decided to manage the orchard and put in a large garden in collaboration with the CRST Elderly Nutrition Center. Mr. O'Hanlon put in a large garden and cared for the orchard until mid-June, there has been no communication from him since.
- Communication with Oyate Connections director, Arlen Lee resulted in a training on June 12<sup>th</sup> with all of the current summer youth participants and their parents, and staff, approximately 50 persons in attendance. A discussion with the Oyate Connections director revealed that their program could not support a summer orchard manager due to insurance issues. The Extension program would have to consider providing insurance for an orchard manager through the Oyate Connections summer employment program. Therefore, Oyate Connections cannot afford to support an orchard manager for the SDSU Extension chokecherry community orchard.

#### Jul-Sept 2017

- Met with Diana Charles at the SDSU Extension in Eagle Butte about the water billing situation for the chokecherry orchard. The CRST Elderly Nutrition Center and SDSU

Extension (Shannon Hamm) have been making payments to the City of Eagle Butte during the months of October through May. Diana has acquired billing information from the City of Eagle Butte and the Elderly Nutrition Center, further evaluation of billing is ongoing.

- On August 1<sup>st</sup>, Marcella Gilbert led a group of three youth and seven adults on a field trip to harvest wild chokecherries. On August 2<sup>nd</sup>, a chokecherry canning session took place in LaPlant with the Simply Smiles youth and adult summer nutrition classes, eight youth and eight adults in attendance. Marcella Gilbert conducted a class in wild foods and native health and Janie Ducheneaux conducted the canning activity.
- On August 3<sup>rd</sup>, a workshop led by Marcella Gilbert on making wild chokecherry cough syrup took place at Simply Smiles with eighteen adults and five youth.
- August 4<sup>th</sup>, the chokecherry jam and cough syrup were part of the inventory of the Simply Smiles roadside food stand managed by local youth and program interns.



## **PROJECT 11(TERMINATED-FINAL)**

**PROJECT TITLE: LAKOTA OYATE TRADITIONAL FOODS SUSTAINABLE FUTURES**

**PROJECT COORDINATOR: SOUTH DAKOTA STATE UNIVERSITY/ PINE RIDGE EXTENSION**

### **Project Summary:**

There were several initial purposes of this project. One was to establish the viability of several traditional Lakota plants foods as a marketable specialty crop; a second was to create a source of plants and seeds for tribal members to establish their own crops or to restore over harvested or threatened areas of the reservation; another was to compare how these wild varieties produce inside a high-tunnel environment and the last was to teach tribal people about high-tunnel production.

The traditional foods of the indigenous tribes of South Dakota, primarily of Oglala Lakota people, have long been a part of the culture, but many of them have disappeared from the day to day diet of the people. For a variety of reasons, not the least of which is the continued fractionation of the average Lakota families' land base (often to a couple acres or less owned by multiple individuals) it has become harder to find sources of these important foods. In addition, improper harvesting techniques and the spraying of chemicals is damaging the remaining wild sources. None the less, some of these foods have never left the diet, nor the traditional trade and barter economies of the tribes. This grant focused on several of the foods that continue to be a part of some tribal members' diets and/or of this reservation economy: the wild raspberry, the wild strawberry along with a couple herbal teas.

We initially proposed purchasing a brand new premium 30' x 48' high tunnel to cultivate a selection of these wild foods and to produce a viable and marketable crop(s). We ended up purchasing a local existing high-tunnel that saved the project several thousand dollars. This high-tunnel needed a little bit of repair work and re-designing but the costs were still significantly lower.

The knowledge of how to use a high tunnel to produce these culturally relevant traditional foods was made available to participants early on in 2015, when first planted. Our Native American Beginning Farmer Rancher Program (NABFRDP) on Pine Ridge also plans to put up a new high-tunnel on the reservation using a different license and bonded contractor and to use the building as a workshop for

tribal members interested in learning what goes into the setting up of a high-tunnel from site selection to orientation to the final putting on of the cover and building the end walls. We will be inviting all of this projects participants and volunteers to date, as well as all Native American Beginning Farmer Rancher participants and all Pine Ridge Ag Economy initiative participants from across the Pine Ridge Reservation. We did make the produce itself, in whatever quantities were available to the public in 2015/2016 primarily to those participants and volunteers in the project. Any produce from the NABFRDP project high-tunnel in 2017 and 2018 will also be made available and will be used in several food preservation and value-added marketing workshops and trainings as planned for the 2017 NABFRDP year.

Initially we had intended to also make the produce (and herbal tea leaves) available in value-added forms (jams, jellies, tea bags, etc.) in 2015 and 2016, however due to issues beyond our control this was not possible. These issues will be discussed later in this report.

We proposed researching whether a high-tunnel would extend the growing season and volume of yields for these crops enough for them to become a cultivated local food source that once again could then become a big part of the diet of Lakota peoples. We plan to continue this aspect of the project as a part of our NABFRDP program in 2017 and 2018.

Due to the relatively small size of space needed to erect and the lower costs associated with purchasing and putting up a high-tunnel (versus a year round greenhouse) we are committed to demonstrating to tribal people how such an investment allows them to use smaller acreages in a more intensive way. In fitting with the cultural values of the People, high-tunnels demonstrate sustainable ways to extend the growing season, increase yields, reduce loss and earn an income off of small acreages. The project also demonstrates how to use traditional foods as a part of a more culturally relevant, Native American focused agricultural crop.

Data already exists on the high tunnel production of the cultivated varieties of many of these foods, but to our knowledge, there is no data on wild varieties cultivated inside a high-tunnel. We had proposed to compare and contrast the two

sets of data. The project proposed to create a baseline of this data and to compare that data against existing primary data. We still plan to do this, but in 2018 and beyond, through the NABFRDP program's high-tunnel.

The continuing threat to these wild gathering areas from increased or cattle grazing, improper harvesting, development on the reservation, and the use of pesticides and herbicides, without regard to the location of these important foods, remain some of the greatest challenges to preserving these traditional foods. Access to the lands that the remaining wild sources are on, remains another challenges to traditional plant gatherers and users. In addition the changing climate continues to directly affect the availability of these foods. Tribal people tell us that as the climate changes, so too does the availability of many of their traditional foods.

There is a need to find sustainable ways to cultivate these wild varieties in order to not only produce the required foods but also to provide a source for transplants and seeds to restore wild gathering areas and to help individual tribal members start their own commercial production.

A value-added market, exists both on and off reservation, especially in regional significant tourist areas around the reservation. Our NABFRDP program and the Pine Ridge Ag Economy initiative will highlight these markets and help participants not only gain knowledge of these markets, but plan for the cultivated production of these important cultural plants both for cultural and commercial purposes.

The initial loss of the end walls exposed the new transplants to inclement weather and vandalism in the spring of 2017. Many of the initial plants inside the high-tunnel were destroyed at this time and losses continued throughout the summer and early fall of 2015 due to vandalism and the ability of wandering dogs and horses to simply enter the high-tunnel.

In spring of 2016, we and our project non-profit partners, Can Wigmunke, the Rainbow Tree, worked with local traditional plant gatherers, Beginning Farmer Rancher Development Program participants and volunteers, to go out across the

reservation and find replacement plants for the wild raspberries and strawberries to try and help the program get back on track. We also collected seeds for the two varieties of wild herbal teas so that we could use these to start the project over. In doing so, these participants gained the knowledge of how to transplant plants from the wild into a cultivated, high-tunnel environment.

The unauthorized removal (and in the process destruction) of the high-tunnel's original end walls, not only allowed vandals and animals easy access into the high-tunnel where they destroyed, damaged or removed the project's plants, but also left us unable to truly document to our participants how high-tunnel production of raspberries, strawberries and herbal teas greatly improves not just the extension of the growing season, but also the size of the yields.

In 2015, before the end walls were removed, 26 participants were able to help plant the original crop inside and learned about the high-tunnel environment and how it extends the season and reduces losses. It was shortly after that the end walls were removed without permission exposing the baby transplants to cold temperatures, wandering livestock and human theft. Ironically, the loss of the end walls, helped to reinforce the effectiveness to participants of growing inside a *controlled* environment versus out in the elements. They saw how well the plants initially responded inside the high-tunnel and how quickly they became damaged, lost or stolen without the complete high-tunnel to protect them and create the protected and enhanced growing environment.

Lastly, the data from this research project was to be compared to primary data already accumulated on the use of high-tunnels to produce the domesticated varieties of these same plants, allowing for a side by side comparison of the varieties to see which performs better inside a high-tunnel. A part of the research was also be duplicated outside the high-tunnel, allowing the project to examine how cultivation and yields of these specialty crops perform inside a high-tunnel and outside (in two different locations). Again, however, the loss of the end walls made the comparison of these impossible.

**The overall motivation of this project was:**

- To demonstrate that it is possible to successfully cultivate some of the wild gathered plant species of foods traditionally used by the Native American tribes of South Dakota (primarily the Oglala Lakota tribe). The project focused primarily on the cultivation of the following species:
  - *Rubus occidentalis, the wild red raspberry*
  - *Fragaria virginiana, the wild strawberry*
  - *Agastache foeniculum, Anise Hyssop* (herbal tea)
  - *Mentha arvensis, the wild field mint* (herbal tea)

Cultivated varieties of raspberries and strawberries have been produced successfully in high-tunnels in South Dakota and Minnesota and Can Wigmunke the Rainbow Tree successfully pilot tested a small raised bed of the herbal teas inside the very high-tunnel where the project was located. This project was designed to test the viability of these traditional wild foods as a cultivated food product and whether or not the produce from these species can then be used to create higher dollar, value-added food products that can be marketed across the state of South Dakota and the United States, even abroad.

The reservation needs its own unique, culturally relevant *specialty crops* that can be produced on small acreages by limited resource and socially disadvantaged tribal members. The success of this project would have served as a demonstration that not only can such crops be sustainably and successfully cultivated from the wild and inside a high-tunnel, but also that they are a viable and exportable crop for reservation residents to produce. The importance of this project is why we plan to continue it under the NABFRDP grant (which ends in Dec. 2017) and beyond.

In addition since no one else on the reservations is currently using these varieties in any significant volume, the success of these crops (primarily the teas in raw form and the berries in a value-added form) would create a niche

market for the socially disadvantaged potential Native American producers of the reservation.

With the popularity of Native American arts and crafts, we continue to feel that if successful such a research project could actually have led to the creation of a new niche market for South Dakota, as well as national and international markets. The setbacks of this project do not in any way deter us from continuing. The project will go on, just under the direction of the Native American Beginning Farmer Rancher Development Program on Pine Ridge.

A secondary motivation of this project was to provide a source of seeds, cuttings, and transplants for these traditional foods to be used by tribal members to restore these foods to wild areas across the reservation. Due to the increasing threats to these wild plants and the decreasing availability of them in the wild, traditional gatherers are often forced to gather these foods from ditches, right of ways and other areas where they might be exposed to chemicals such as pesticides, herbicides etc. So a clean source not only for the produce but for the plants and seeds themselves is vital to the continued use of these foods.

A third motivation was to train up a cooperative (ideally a formal one but also initially possibly an informal one) of traditional tribal plant gatherers in the use of a high-tunnel, the transplanting of these traditional foods from the wild into cultivation and from cultivation back into the wild. This cooperative has a few informal beginnings and we continue to work with the various groups to bring them together as a formal cooperative. Some of these groups have expressed the desire to work with the tribe to identify areas on tribal lands where these foods still remain for conservation protection for future generations.

**Project Approach:**

- A) Set up or purchase a high-tunnel on the reservation
- B) Acquire plant starts and seeds for the non-domesticated varieties to be planted inside the high-tunnel and outside in the plots.

- C) Recruit prospective producers from amongst small acreage land owners and traditional plant gatherers who are already familiar with these plants in the wild.
- D) Accumulate data on the use of high-tunnels to grow the domesticated varieties or related varieties of these plants from SDSU and South Dakota Dept. of Ag resources.
- E) Train a local resident in how to care for the plants (indoor and out) and how to collect the necessary data for the Specialists.
- Work with the producers and gatherers to identify areas in the wild needing conservation and restoration.
- Train this informal cooperative in food preservation methods that lead towards value-added products based off of these traditional foods.
- Work with this group to develop a marketing plan for the sale of these products and the raw produce on the reservation.

A used high-tunnel, in good condition was purchased from Can Wigmunke, the Rainbow Tree (a tribally founded and led 501(c)(3) non-profit organization). Initially the project was going to use Can Wigmunke's high-tunnel as non-federal match for the grant as an additional classroom room space for the project, but when our program struggled to find a site to set up the new high-tunnel, we arranged to purchase Can Wigmunke's high-tunnel at a really fair price, far below what was budgeted. This move allowed us to keep the project on schedule in 2015 up to and until the destruction of the end walls. The initial match amount written into the grant (\$8000) was reduced by SDDA because we're ending the program early and did not expend the total amount of granted funds. The current amount of match required is \$2,600. Can Wigmunke's volunteers provided 116 hours of volunteer time over the 2015 and 2016 season. Calculated at the current national value of volunteer hours, \$23.07, that comes to \$2,676.12. Most of these hours were in 2015, when the initial planting was done in the as yet undamaged high-tunnel and again in the fall of 2015 and spring of 2016 working with traditional plant gatherers and participants to harvest baby plants and seeds from the wild to replace those destroyed or stolen in 2015. In addition in 2015-2016, three tribal members volunteered to keep the site weeded and watered (despite the lack of end walls) in an effort to keep the project viable.

## **Delays and struggles to the project:**

After purchasing the high-tunnel in 2015, we wanted to hire a contractor to rebuild the end walls that had damage at their base from the 2013 Atlas Blizzard and replace their 6 mil polyweave fabric end walls with wooden ones to strengthen the overall structural integrity and make it more secure against potential vandals. Also asked for in the bidding request was to add exhaust vents and fans, garage doors on the front and the rear to aid in ventilation. We approached three local bonded contractors and asked them to submit bids.

One of those contractors also happened to be the landlord for the Pine Ridge Extension office and the site of the high-tunnel. He proceeded, without submitting a bid nor receiving any permission to do so, to tear down the end walls and haul them to the Kyle dump while the office staff were away from the office on a weekend.

When confronted with the fact that he hadn't submitted a bid nor received approval and asked to put back up the end walls, we learned that he'd thrown them away and that the fabric walls were destroyed in the removal process. We instructed him that we could not approve any work without a bid and asked him to submit a bid at that time for the replacement of the end walls as originally specified. He refused. He said since the project was taking place on his land, he should get the job. We told him we were required to bid the project out. We hit an impasse with him and so for the entire 2015 growing season, the high-tunnel remained without end walls. The other two contractors did not want to submit bids on a project that was already small, now even smaller without the demo work. During this time the majority of the plants were destroyed by cold temps, eaten, trampled or stolen as there was no way to secure the site. Repeated efforts to get the landlord to bid the project failed.

The following fall, while the staff were away at SDSU Extension's Annual Fall Conference, the same negligent contractor put up end walls, but not with an approved bid or permission and not according to the design specifications requested in the bid request. He installed one garage door on the rear of the structure, but failed to attach the top of the end wall to the rest of the high-tunnel

frame, leaving a half a foot gap open to the elements. Once again, he was told that no such work had been approved or authorized and we attempted for the entire 2016 year, including in writing, to get a bid to find out how much he wanted to be paid for his work and to correct the errors. No such information was provided. As of 1/3/17, we still have never heard from this contractor how much he'd like to be paid. He's never provided us with keys to the high-tunnel so we can't even lock the door, so the site remained unsecure.

In the summer of 2016, a powerful thunderstorm tore through the area and the winds got in between the gap on the rear end wall where he failed to attach it. It completely tore off the 6 mil polyweave fabric cover, which put up a good fight. The high-tunnel's metal hoops were bent, some cracked and the baseboards were torn up and broken. Many of the remaining plants inside were damaged in the storm. The remainders were made available to the tribal members who participated in the program to plant in their own land.

To date, the high-tunnel remains severely damaged, uncovered, the end wall situation remains unsolved and the contractor refuses to submit a bid or an invoice.

Other complicating factors are that two of the individuals written into the initial grant proposal, including the main PI, are no longer with Extension. Shawn Burke and Mary Rodner are no longer with SDSU Extension. Mr. Burke as the primary PI on the initial grant was the one who made the final decision on how to proceed with the selection of the high-tunnel site and who decided to ask for a bid from the contractor who caused all the problems. As Co-PI I had strongly urged against asking for a bid from this individual, but was over-ruled. I feel that had we not asked him for a bid, there may have still been some issues with this individual as he and his family own the land, but had we gone with a different contractor, the walls would have been properly and promptly removed and rebuilt (according to proper specs) and I feel that project would be on track. This is water under the bridge at this point however. Our plan to move forward with the project under the umbrella of the NABFRDP program will help us get the project re-established on a site in no way affected by either this landlord/contractor who caused the initial problem. Our new landlords will be the Oglala Sioux Tribe and its Medicine Root District itself. Not an individual tribal member. It will also be located in a site we

already use as a teaching/demonstration site, is highly visible in the community and has even more community partners involved in the area.

No funds were expended from the grant since Jan. of 2016 according to SDSU's grants office staff.

### **Goals and Outcomes Achieved:**

At this point, we do not feel that the grant's goals and outcomes can be fully achieved by the end of the specialty crop grant period. We have identified another site to erect a high-tunnel and do plan to start the project over but funded through our Beginning Farmer Rancher Development Program. However, despite all of the above, we do feel that we accomplished some things.

**Goal 1a: Train 20 prospective high-tunnel, traditional food producers on the use of high-tunnel production system to grow traditional foods:** We worked in 2015 directly with 6 traditional plant gatherers on the initial planting of the high-tunnel and conducted along with Can Wigmunke, a high-tunnel/traditional foods workshop, attended by 20 individuals.

**Goal 2a: Create a source of seeds and plant starts for additional new producers in the future:** when the high-tunnel was destroyed, we helped participants come in and collect the seeds and remaining plants this fall to their homes. Also participants learned to harvest for seeds and transplants directly from the wild, for re-transplanting for cultivation.

**Goal 3a: Create a Grower's Association on the reservation:** an informal cooperative has begun, between traditional plant gatherers who participated in aspects of this program along with some of SDSU Extension's Native American Beginning Farmer Rancher Development Program and participants of the USDA's Pine Ridge Ag Economy initiative. Though still informal at this point, there are at least three who are committed to using high-tunnels to produce the wild herbal teas, some are looking at raspberries and strawberries in their production plans. All them with an eye to use these to make value-added products in the 2017 and 2018 production seasons.

**Goal 4a: Compare the success of producing these wild varieties in a high-tunnel vs outside:** Due to the end wall issue and loss of the plants, we were unable to reach this goal. We were able to work with a group of traditional gatherers to document how the plants in the wild were doing and to compare these with how the same species were doing under the high-tunnel, cover, with drip irrigation. They learned how intentional irrigation of these wild plants increased the size, health and number of fruits per plant, versus in the wild. Without end walls it was hard to show the benefits of season extension, though in spring of 2015 they were planting the initial plants way before the wild plants were coming out of dormancy. So they were able to see aspects of the seasonal extension. Just not the big picture.

**Outcome 1a: Train 20 prospective high-tunnel, traditional food producers on the use of high-tunnel production system to grow traditional foods:** 3 producers are committed to using high-tunnels to produce and cultivate wild varieties of herbal teas, raspberries, strawberries. More than 20 participated in the programs as a whole, but due to the lack end walls, we don't claim that these participants were able to get the full picture and experience about high-tunnel production. We have more than 20 individuals on Pine Ridge interested and who were involved in one or more aspects of the project. All 32 individuals in the Native American Beginning Farmer Rancher Program on Pine Ridge were introduced to the concept of transplanting these crops from the wild, or starting or ordering them from seed/transplant and starting a crop on their land. Some are planning to incorporate the crops not in a high-tunnel but in their shelter belts, along with other native species such as wild plum, chokecherry, etc. while others are planning to apply through NRCS's EQUIP program for the 90% match on a high-tunnel and with FSA and/or Lakota Funds (the local CDFI) to cover the remaining 10% of the high-tunnel costs, plus drip-irrigation, etc.

**Outcome 2a Pounds of seeds and number of starter plants produced in the high-tunnel in year one and two:** This objective was not met due to the above situations. Seeds were collected in the fall of 2015 and 2016 (both from the high tunnel and from the wild) and all surviving plants (from the high-tunnel) were given to the volunteers and participants who helped on this project, but as the project struggled so much, the amount is not significant enough to report.

**Objective 3a) Create a Grower's Association:** an informal cooperative has begun, between traditional plant gatherers who participated in aspects of this program along with some of SDSU Extension's Native American Beginning Farmer Rancher Development Program and participants of the USDA's Pine Ridge Ag Economy initiative. Though still informal at this point, there are at least three who are committed to using high-tunnels to produce their tribal wild herbal teas, raspberries and strawberries in their production plans and to use these to make value-added products in the 2017 and 2018 production seasons.

**Objective 4a) Raw data comparing number of plants, yield of plants inside the high-tunnel versus outside, pest problems inside and out, dates when plants inside and out produced and when they frosted out (length of season):**

Objective remains unmet due to the damage and contractor situation described above. The plan is to compare the data once the Native American Beginning Farmer Rancher Program purchases and erects its new high-tunnel and plants it with these crops.

The overall big picture, long term goal and the project itself will continue in 2017 and beyond however, through the Native American Beginning Farmer Rancher Program, the Pine Ridge Ag Economy Initiative, and through partnership with Can Wigmunke the Rainbow Tree, Our Lady of Sorrows Catholic Church, the Medicine Root District and the Oglala Sioux Tribe who are all working together to secure several acres, adjacent to the SDSU Extension's (BFRDP) Beginning Farmer Rancher Program's 1/3 acre demonstration site. The plan is once the lease is secured, to purchase another brand new high-tunnel, work with a different licensed and bonded contractor to build the high-tunnel, work with the BFRDP program students and the Pine Ridge Ag Economy Initiative to plant the project's traditional food crops and others inside and use the site as initially laid out in the original grant.

The Pine Ridge Ag Economy (PRAE) Initiative will work with a cooperative of tribal growers and NRCS to set up high tunnels with the goal of creating a formal cooperative of certified organic, tribal high-tunnel producers on the Pine Ridge Reservation. They have asked SDSU Extension and its Native American BFRDP

program to provide the technical assistance and training to these new and beginning producers. Several of the PRAE cooperative's members participated in the Lakota Oyate Traditional Foods Sustainable Futures program despite the many setbacks and do not wish to see the project's goal unmet.

Two of these tribal new producers would like to submit a proposal to the South Dakota Dept. of Ag for a specialty crop grant using high-tunnels and traditional foods and have asked us if we'd provide the technical assistance and training as well as help them develop their production, business, and food safety plans in 2017.

**Beneficiaries:** the participants of both the Lakota Oyate Traditional Foods Sustainable Futures project and the Native American Beginning Farmer and Rancher Program, as well as the volunteers who cared for the plants all benefited from an increase in knowledge and awareness of both high-tunnels and their potential; how to harvest these plants from the wild in sustainable ways; how to gather seeds and transplant from the wild and into a cultivated and controlled area; how drip-irrigation can reduce diseases, water loss, aid in weed management and gets the water directly to the roots of the plant, thus helping the plant to produce and overall be healthier and stronger.

Several traditional gatherers are now involved with the Native American Beginning Farmer and Rancher Development Program and three new producers will be producing at least some of the project's targeted varieties in their commercial operations. The larger beneficiaries will be tribal members across the Pine Ridge reservation and beyond. The Native American Beginning Farmer Rancher program conducts trainings and outreach on the Pine Ridge, Rosebud, and Cheyenne River Reservations and will be adding Standing Rock and an urban agriculture component in 2017. In all of these areas, the incorporation of these wild varieties will be encouraged.

### **Lessons Learned:**

The potential economic impact of this project towards helping tribal members make the most use of their small acreages and become involved in an agricultural

enterprise and its cultural impact for Native American peoples on the Pine Ridge reservation (through the preservation of traditional plant knowledge, the restoration of wild areas, the identification and protection of wild gathering areas, the creation of a cooperative) and the creation of a culturally relevant niche ag market is significant. Our experience of incorporating aspects of this project into the Beginning Farmer Rancher Program's discussions with new producers and into the discussions that are taking place as a part of the Pine Ridge Ag Economy initiative have shown us that there is a strong interest in developing a culturally relevant agricultural horticultural products for reservations. However, there are some things we learned the hard way and would recommend to anyone else looking to start a similar project on the reservations in South Dakota.

- Always secure the site of a high-tunnel with a written lease before purchasing or erecting a high-tunnel structure.
- Always work with a licensed and bonded contractor, who you've done your due diligence background checking on (have there been problems with them completing projects or doing them incorrectly before) and get them to sign a bid request form.
- Physical control of the site is vital. If the site can't be relatively secured and also easily accessible by staff and volunteers, than it's bound for struggles.
- Having the Tribe (OST) or a district council as the landlord is a better option than an individual landowner and never use a landlord whose also the contractor on the project.
- Tribal law on Pine Ridge requires a certain percentage of the labor involved in building contracts be enrolled tribal members, so we went with a tribal contractor who also happens to be our Extension office's landlord. However, in hindsight we should have approached, first, other contractors who work on the reservation. We did contact these folks, but before they could even turn in a bid, the landlord had torn off the end walls and destroyed them. Lesson here, is put everything in writing and due your background research on both the site and the contractor's work history. As the initial removal and destruction of the end walls was done without our permission as well as the putting up of the new end walls (without

permission, not following the specs given in the bid request, and without our observation) there's a lot that was out of our control, so our suggestion is do as much prep work as you can, get everything in writing, so that you can lower the risk of something similar happening to your project.

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**Additional Information:**

See attached photographs:



The Damage done in the 2016 storm that tore off the cover, pulled the end walls from the hoops, twisted and cracked several hoops, bent and cracked the base boards and their accompanying tracks/wiggle wire (holds the cover onto the baseboards).



A photograph from another location of the same storm that tore the cover off and damaged the structure and pulled the newly built end walls from the end wall hoops (because they had not been properly secured to the end hoops and the contractor left a six inch plus gap between the top of the end wall and the rest of the structure at the top. When these winds hit, it entered that gap and tore the cover off from that location.



Mentha Arvensis in the wild. From a location where seed was gathered along with transplants in 2015 and 2016 to help get the project restarted.



Photograph from wild raspberries produced inside the high tunnel despite the loss of the cover. All of the surviving plants were transplanted into pots and given to tribal members who participated in the program to help them start their own plants at home.



Wild Strawberry's inside the high-tunnel, before they were eaten or damaged in 2015. Any remaining plants that survived into the fall of 2016 were also transplanted into pots and given to tribal members who participated in the program to help them start their own plants at home.

## **PROJECT 12 (FINAL)**

**PROJECT TITLE: BUY FRESH BUY LOCAL SOUTH DAKOTA**

**PROJECT COORDINATOR: SOUTH DAKOTA SPECIALTY PRODUCER ASSOCIATION**

### **Project Summary**

*Buy Fresh Buy Local South Dakota* provides technical, promotion and organizing skills to establish Farmers Markets in rural and reservation communities in South Dakota.

### **Project Approach**

Buy Fresh Buy Local SD (BFBLSD) assisted Wagner, White River, Kyle, Eagle Butte, Mission and Murdo farmers market specialty crop producers. The communities of Wagner and Murdo have received promotional materials to promote the market site and market days. The communities of Kyle and Eagle Butte received their promotional materials in 2014 with Mission and White River receiving their promotional material in 2015. The farmers markets are utilizing marketing materials to promote the specialty crop producers.

The promotion concept is to identify farmer's market location with signage stating the market days, hours and location to allow customers to identify market details on a continuous basis. The survey will be used as baseline to evaluate the effectiveness of market site promotion. The next few years of data will allow a review farmers market activity to develop a promotion program for specialty crop producers.

### **Goals and Outcomes Achieved**

A survey at the conclusion of the 2015 specialty crop farmers market season to measure market participation:

Farmers Market Name	Number of markets / season	Number of specialty crop vendors / season	Number market customers / season	Gross specialty crop market sales / season
Murdo Farmers Market	8	6	225	\$2,150.00
Eagle Butte Farmers Market	6	5	112	\$1,005.00
Wagner Farmers Market	10	12	460	\$4,115.00
Kyle Famers Market	8	4	212	\$1,610.00
White River Farmers Market	6	3	64	\$440.00
Mission Farmers Market	8	5	85	\$555.00

Buy Fresh Buy Local SD partnership with Dakota Rural Action provides financial assistance for the SD Local Foods Guide. The guide is an excellent publication with statewide coverage of all local specialty crop producers. The guide is a requirement for BFBLSD organization, but a decision was reached not to duplicate services and cooperate with the existing publication. Please see the link [SD Local Specialty Crops guide](#) for details and view the food guide.

Buy Fresh Buy Local SD also maintained and financed the BFBLSD.org website to provide timely information and updates regarding specialty crops in South Dakota.

### **Beneficiaries**

The main beneficiary is the specialty crop producer. The citizens of the rural or reservation community also benefit by efforts to increase consumption of local foods throughout South Dakota. Each market needs dependable supply, reasonable profit, constant quality and good promotion, all goals of the *Buy Fresh Buy Local SD*.

### **Lessons Learned**

The strongest barrier regarding farmers markets in very rural areas is developing relationships with the community leadership. Technology is not readily available in many of the communities and that requires onsite visits / long time frame correspondence to provide the assistances as required by the grant goal: Increase technical, promotion and organizing skills for specialty crops at rural and reservation community farmers markets in South Dakota.

### **Any Additional Information**

BFBLSD will continue to provide assistance to the communities currently using the promotional materials and now have Mission and White River using the promotional material.

The current survey will be used as baseline to evaluate the effectiveness of market site promotion. The next few years of data will provide a review of farmers market activity to develop a promotion program for specialty crop producers. The data will become more valid after a few years of collection and as we add the additional farmers markets.

## **PROJECT 13 (FINAL)**

**PROJECT TITLE: WIYAN TOKA WIN (“LEADING LADY”) GARDEN**

**PROJECT COORDINATOR: CHEYENNE RIVER YOUTH PROJECT**

### **Project Summary**

The **Wiyan Toka Win (“Leading Lady”) Garden** is key component of CRYP programs and services and is the cornerstone in our efforts to build a more sustainable food system on the Cheyenne River Sioux reservation, while fostering environmental stewardship. The garden project is guided by traditional and spiritual principles, incorporating our Lakota values into the gardens development – Generosity, Spirituality, Wisdom, Respect, Courage, Honest, and Patience. Built upon a unique combination of spiritual, human and land-based resources, CRYP children, their families and even community elders are involved in the 2-acre Wiyan Toka Win Garden. One of the most important aspects of the garden program is to foster community participation so the value of gardening and knowledge of traditional agricultural methods can be transferred from generation to generation.

### **Project Approach**

During the growing season, CRYP engaged 200 youth in planting and harvesting the garden; utilized **4 tons** of produce from the garden for daily meals and snack provided to CRYP children and teens and for operating the weekly CRYP Farmers Market and included families across the reservation; provided workshops (classes) to youth and tribal community on developing food systems and other garden related topics coupled with business development and financial management courses; and preserved **420 jars** of produce to use in meals and snacks throughout the year and for CRYP social enterprises including the farmers market, gift shop and café.

### **Goals and Outcomes Achieved**

The overall goal of the project is to improve the health and wellness of youth and families residing on the reservation by providing fresh produce to the community and providing education to community members to encourage the growth of our local food system.

Outcomes were achieved through the following activities:

- 200 youth from The Main Youth Center (ages 4 -12) and the Teen Center (ages 13-18) participated in garden planting and harvesting. (Attachment 1 – CRYP Participants)
- This year CRPY harvested nearly 6 tons of produce including several varieties of beans, corn, squash, peppers, zucchini, carrots, beets, turnips, potatoes, eggplant, lettuce,

rhubarb, raspberries, blackberries and strawberries, all of which are naturally grown. (Attachment 2 – Harvest Report)

- Produce from the garden was incorporated into daily meals and snacks.
- CRYP Farmers Market operated for 7 weeks. Farmers Market revenues were not met due to harvest increases. However, produce not sold was given to the Cheyenne River community, allowing CRPY to achieve its goal of improving community health and wellness through the distribution of naturally-grown, fresh fruit and vegetables.
- CRYP 2015 canning inventory includes 420 jars of pickles, salsa and jams. (Attachment 3 – Canning Inventory)

## **Beneficiaries**

The 2-acre Wiyan Toka Win garden, isn't just a garden. It's the cornerstone of CRYP's efforts to build a more sustainable food system on the Cheyenne River Sioux Reservation, while fostering environmental stewardship. The garden serves as an outdoor fitness center for the youth and community members as they work the garden; a health food store providing essential nutritious products that are available at affordable prices through our farmers market and free to all children participating in our CRYP daily meal programs; an engine for economic development that will generate income for families participating in the farmers market and for CRYP; and finally – a classroom for all ages. Youth and community members will learn all about food security, starting and expanding their gardens, traditional agriculture, harvest and preserving produce, nutritional benefits of natural gardens and the positive experience of working together as a community to address the community's needs and hopes.

## **Lessons Learned**

Using the *start to finish* approach in the garden allowed CRYP youth to fully participate in and understand the benefits of farm to table food production. By participating in soil preparation, planting, garden maintenance, harvesting and food preparation, both children and teens learned how healthy foods are produced and prepared. With active learning in the garden, participants realized they could directly impact their own health through food choices while at the same time impacting their community and environment through sustainable farming practices. Understanding that lifestyle choices impact not just yourself but your community as well is a valuable lesson for Cheyenne River youth.

The diversity of this season's crop was exciting for everyone. CRYP participants learned that making healthy lifestyle choices means you also find fulfillment through personal growth and creativity. Participants grew vegetables they had never seen before; vegetables like swiss chard and spaghetti squash. Preparing and eating "new" vegetables was fun, and participants gained confidence in their creative ability to meet any challenge. (Attachment 4 – Sample Garden Intern Journal)

## **PROJECT 14 (FINAL)**

**PROJECT TITLE: 2015 FARMERS MARKET GROWERS GRANT**

**PROJECT COORDINATOR: SOUTH DAKOTA DEPARTMENT OF AGRICULTURE**

### **Project Summary**

Farmer's Markets are an important outlet for specialty crop producers to market their products. They also foster interaction between producers and consumers. There are many new specialty crop producers selling their products at farmers markets. Many of them have questions on pricing their fruits and vegetables. Right now, the information collected from this project is the only information available from a cross section of farmers markets across the state.

In 2012 and 2013, we collected baseline data about the price vendors were charging for specialty crops, and the amount of sales vendors were making at the farmers market. The 2012 data now serves as the baseline data for all future collections moving forward. This information is helpful for potential specialty crop producers or beginning producers as they start pricing their product for sale.

We worked with a diverse size of farmers markets (small, medium and large) as well as markets that are spread out geographically across the state (both West and East).

### **Project Approach**

SDDA used our network of farmers markets and provided information to all of them about this program. We informed potential applicants about the program. Information and the application were also available on our website.

There are currently over 60 farmers markets in South Dakota. We originally approved 12 applications, 1 market did not respond back, All successful farmers markets were notified of funding.

Qualifying farmers markets were eligible for \$1,500 grant. Fifty percent of the funds were made available upon signing a grant agreement and fifty percent of funds were made available when all information was successfully submitted. One market opened late and closed early and received only 50% of their funds.

Farmers market managers submitted three pieces of information to SDDA over the course of the growing season.

1. Markets were required to record and submit lists of specialty crop products sold and their respective sale prices at four different times throughout the season to SDDA. SDDA provided a template for farmers markets' use. Pricing information was collected by all markets:
  - The second market in June
  - The third market in July

- The third market in August
  - The third market in September
2. Farmers markets also submitted gross sales data from their vendors at three different times throughout the season (June, August and September) to SDDA. Vendors submitted the data anonymously by writing their gross sales figures on a slip of paper and putting it in a sealed envelope given to the farmers market manager.
  3. Farmers markets collected customer information through a dot survey once during the market season. Information collected included the following information: miles traveled to market, how often shop at farmers market, customer dollars spent at the market and what purchased..

We sent them a template for reporting pricing and gross sales. We sent them email reminders and/or follow up phone calls to remind them to collect this information and submit it to SDDA.

### Goals and Outcomes Achieved

#### EXPECTED MEASURABLE OUTCOMES

Goal	Performance Measure	Benchmark	Target
Increase information available about pricing for fruits and vegetables	Increase the awareness of the prices of fruits and vegetable. (Collected through surveys.	Information not available	90% of people that receive this information will find it useful
Promotion of farmers markets and vendor recruitment	Increase public awareness of when and where markets are open.	Facebook, signs and banners	People will visit more markets.

### Beneficiaries

Interest in purchasing fruits and vegetables directly from the producers is also at an all-time high. SDDA has seen a high interest from the industry in the local foods movement. Collecting pricing information from the farmers markets will help us to continue to gauge the economic impact that farmers market have across the state..

Collecting this data will also us to know when specialty crops are available at the farmers markets and will allow specialty crop producers to identify new opportunities for brining early and late season crops to the market, which will expand their sales and income. For example, we've identified that many early season crops (such as lettuce, spinach, asparagus, etc.) are

not in great supply – there is an opportunity for specialty crop producers to bring these products to market and expand their seasonal sales. We’ve also noticed that sales drop off a fairly significant amount late in the growing season (around the third week in September). Knowing this information can help farmers markets to do more marketing early and late in the season to draw those customers in and help the specialty crop vendors increase their sales during these times.

### **Lessons Learned**

Going forward, we have learned some lessons and will be conducting the application process a bit different in coming years. In 2012, we approved applications on a first come-first served basis, but this may not be the best choice. Because of the selection process, we lacked diversity in the size of the markets. In 2015, we included a wider array of market sizes in the selection process. We also want to continue to make sure that we have geographic variety in the markets – that the markets involved in this program are spread out across the state and aren’t all concentrated in one area of the state.

### **Contact Person**

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### **Additional Information**

#### **Procedures for Conducting Dot Surveys**

1. Choose a market day in mid-season to conduct the survey
2. Purchase supplies
3. Write the questions and answers (provided below) on 4 separate easels or posters
4. Have a volunteer(s) direct customers towards the survey at the market
5. Tally up the answers and mail or email your raw data to SDDA. You do not need to make charts or graphs. Send us only the number of dots on each answer to each question.

#### Questions to ask on your dot survey

1. How many miles did you travel to attend the market today?
  - a. Less than 1 mile
  - b. 1 – 5 miles
  - c. 5 – 10 miles
  - d. More than 10 miles
2. How often do you shop at the farmers market
  - a. Every week

- b. 2-3 times/month
  - c. Once a month
  - d. Infrequently
  - e. First Time
3. How much have you (or will you) spend at the market today?
- a. Less than \$10
  - b. \$10 - \$15
  - c. \$16 - \$20
  - d. \$21 - \$25
  - e. More than \$25
4. What did you (or will you) purchase today?
- a. Fresh fruits and vegetables
  - b. Baked goods (breads, cakes, etc.)
  - c. Processed/prepared foods (salsa, jams, pot pies, etc.)
  - d. Other