SAVORY EATS
FINAL PERFORMANCE REPORT

Project Title

Extending the Growing Season for Nebraska Specialty Crop Growers

Project Summary

Nebraska's fertile Typic Argiustolls soils that expand across Nebraska's 77,358 square miles play a large role in the state's agricultural success. It has enabled fruit and vegetable growers with the ability to respond to the rising consumer demand for locally grown produce in recent years. But, despite the state's agricultural success, its growing season has its limitations. Growing days range as long as 165 days in the southeast to 120 days in the northwest with killing frosts ranging from October to April and September to May, respectively. Since Nebraska's humid continental and semi-arid climates do not provide fruit and vegetable growers with the luxury of multiple growing seasons within a single calendar year, growers are constantly exploring new avenues with which to extend their seasons to increase crop productivity.

It's no secret that season extension practices, especially plastic mulches and high tunnels, are becoming extremely popular nationwide as more gardeners see them as essential, practical methods to extending the growing season and increasing crop productivity. These methods produce earlier crops in the spring and maintain consistent production well into the fall, thus, increasing the income and profitability of local gardeners.

In an effort to address this need, the U.S. Department of Agriculture (USDA) provided a grant to the Nebraska Department of Agriculture (NDA) to administer a project that is designed to provide small, competitive grants, in the amounts of up to $4,600, to a limited number of Nebraska specialty crop growers for the sole purpose of extending the growing season for specialty crops.

Savory Eats was one of the grant sub-recipient's in 2012 who received Specialty Crop Block Grant Program (SCBGP) funding to construct and implement a season extension practice. They decided to construct and erect a high tunnel that is designed to increase their raspberry crop yield and lengthen the growing season for this specialty crop. This report is a description of Savory Eats' high tunnel unit and how it will extend the season for Nebraska specialty crops. A primary goal of this project is to increase the season extension knowledge base among specialty crop producers and to encourage growers to consider adopting similar production methods to into their own operations.

Project Approach and Goals and Outcomes Achieved

Savory Eats is a small diversified farm operation that has been in operation for approximately two years now. They are located near Brunswick, Nebraska, which is a small town located in northeast Nebraska. They raise a number of produce crops on 2.5 acres, including aronia berries, which is a relatively new crop that has gained a lot of attention over the past few years. Savory Eats currently sells produce at the Santee Farmers' Market, which is a market held in a Nebraska Indian Reservation that primarily consists of Native American vendors.

Topographically, Brunswick is located in an area of the state identified as the "Plains" region. The Plains consist of flat-lying land that lies above a valley. The materials of the plains are sandstone or stream-deposited silt, clay, sand, and gravel overlain by wind-deposited silt (loess).

Savory Eats applied for grant funds to build a high tunnel to enhance their raspberry crop. Savory Eats has over 250 raspberry plants that are capable of producing fruit well into the fall months. However, harvesting berries has been severely limited due to the early frosts they have experienced in the months of September. The early frosts have led to shorter growing seasons, lower yields, and loss of potential income. It was determined that the advantage of a high tunnel would protect the plants from the frost allowing them to bear fruit into November, thus, enabling Savory Eats to demand a premium for their berries, especially during certain times of the year when this crop is not in season. There are a couple of reasons why Savory Eats scored so well on their application and why they were selected as a grant recipient.

1. Nebraska has a small and somewhat limited fruit industry. The number of Nebraska vegetable growers far outweigh the fruit growers. Therefore, in an effort to find ways to promote the fruit industry, it was decided Savory Eats would be an excellent candidate of grant funds. It was determined that a high tunnel would likely increase the number of growing days, avoiding killing frosts in September, and increase the market viability of raspberries and potentially other popular fruits grown in Nebraska. Funds were awarded to Savor Eats to purchase and construct a high tunnel for their raspberry plants. The high tunnel was built by October 2012, and the raspberry plants will be transplanted beneath the high tunnel in the spring of 2013.

2. Savory Eats is a relatively new business and is considered a beginning grower operation. NDA supports agricultural operations of all shapes and sizes and utilizing grant funds to help beginning growers is just as important as helping intermediate, advanced, and/or experienced growers. High tunnels are an affordable unit that can be easily adaptable to Nebraska's landscape and production needs. They vary in size and can easily be scaled to fit beginning, intermediate, or advanced growers.

Savory Eats has two raspberry varieties. Some bear fruit in the spring and the others bear fruit in the fall. The growing days in this area of the state are relatively shorter than those in the southern areas with killing frosts that hit as early as September. This area is two climate zones colder than southeastern Nebraska. Savory Eats has been using a rather archaic method of extending the season of their fall raspberry varieties despite repeated days of freezing temperatures. Their practice involves watering the plants in the evenings, allowing the frigid night temperatures to freeze the water on the plants, so they are covered in ice. During the day, the sun melts the ice, but the process is then repeated the following night. To some degree, this freezing/thawing method has protected the plants allowing them to bear fruit longer in the season, but it has been met with only marginal success. Their high tunnel was built so these fall fruit bearing raspberry crops can be transplanted under the high tunnel next spring, so this ancient freezing/thawing method can be disposed of.

Figure 1 - Frozen Raspberries

High tunnel bramble production offers the opportunity to bridge the gaps in availability during late spring and late fall. Because tunnels offer a less expensive form of season extension than greenhouses, they appear to be an ideal production option when temperatures reach the freezing point. Furthermore, high tunnels allow less hardy floricane-fruiting raspberries to overwinter in climates where they would otherwise be killed. High tunnels allow raspberries to be produced where the growing season is too short otherwise to mature the crop. These technologies, coupled with the continued development of new varieties and field production techniques, bring the goal of all season bramble production closer to fruition.

Figure 2 - High Tunnel

Savory Eats' high tunnel is 30 feet wide and 60 feet long. It is simply a large hoop house covered in plastic, with sides end walls to be opened to regulate temperature (Figure 2). It provides an intermediate level of environmental protection and control between field production and greenhouse production. The tunnel is not heated, but traps the heat from the sunlight's rays always keeping the tunnel warmer than the temperature outside the tunnel. Although this tunnel is not yet irrigated, an irrigation system can easily be installed and is necessary as the protective covering nature excludes rainfall. When the plants are transplanted under the tunnel in the spring of 2013, they will be placed relatively close in spacing. It was decided that installing the tunnel over existing rows as an afterthought would be difficult, and the row spacing could not be changed. Additionally, it was thought that there could be a possibility that diseases and weeds for berries grown in tunnels could gain a foothold in the planting prior to covering the tunnel. This size of tunnel should allow

for 5 rows, 2 feet wide, with a buffer strip between each row. The tunnel should be able to house up to 300 raspberry plants.

High tunnels used in raspberry production can greatly extend the market season, beginning in early spring (March) for some floricane-fruiting cultivars and extending through late fall (November). This extended season will assist Savory Eats and other growers in capturing a larger market share, especially early and late season when premium prices are paid for raspberries. High tunnel production will likely result in improved fruit quality and shelf life and a more consistent crop harvest. Raspberries may be kept up to a week in cold storage without significant deterioration. It will also ensure continuous fruit production when conditions for field harvest are unfavorable. Soil warming, wind, longer growing degree days, and rain protection are just some of the benefits of high tunnel production over field production. The need for disease, insect, and wildlife management, compared to field production, will also be reduced; this minimizes pesticide inputs. In addition, the high tunnel production will allow for diversification of farming operations, requiring less capital expenditure than greenhouse production, and for relatively low investment, often yields high returns.

Location often dictates when crops are to be planted. The number of days crops need to mature are closely related to their Growing Degree Day (GDD) requirements. For example, specialty crops planted on April 25 in east central Nebraska normally would take longer to mature than if planted on May 20 when the temperature is warmer. However, the disadvantage is that planting crops during warmer temperatures shortens the maturity dates and limits the number of cool season crops that can be grown. The season temperature of a region must be able to meet the GDD requirements of a crop or it will not be adapted. The GDD availability for a crop decreases as the time of planting is delayed; therefore, the adaptability of different crops changes from the beginning to the end of the season. Since the amount of GDD and the dates of killing frosts varies from year to year, planting dates have different freeze risks.

Beneficiaries

Longer seasons result in larger annual incomes, customer retention, higher yields, and premium prices. Additionally, it can provide extended employment for skilled workers on produce farms who might otherwise be lost to other jobs at the end of the growing season.

The farm tour was held near Brunswick, Nebraska, on October 4th. NDA worked with Savory Eats to publicize this event. NDA sent approximately 246 postcards to growers surrounding the Brunswick area encouraging them to attend. Due to the small fruit industry in Nebraska, raspberry growers were included on this list. The postcards reached growers in 39 Nebraska counties. Additional postcards were sent to Savory Eats for additional publication in an effort to better canvas this area, and NDA sent individual announcements to non-profit organizations and University personnel who might have a potential interest in the tour. The announcement was posted on the Nebraska Our Best to You website. Growers were asked to RSVP to NDA by September 30th. An e-mail reminder was sent on September 17th to growers who received the announcement, had an e-mail address, but

had not yet made a reservation. A total of 41 RSVPs were received prior to the event, and 31 attended the farm tour.

Lessons Learned

A construction crew was hired to erect the high tunnel, which cost an additional $4,000. During this process, the crew tore a hole in the plastic when it was being installed. Fortunately, when the order was placed for the high tunnel materials, the FarmTek salesperson had suggested that Savory Eats order a roll of the repair tape. This was used to replace the tear in the plastic. Although the high tunnel construction was completed, Savory Eats was not satisfied with the way the crew assembled the side walls. They will be adjusted in the summer of 2013.

Another problem was encountered when the end wall plastic was torn due to the strong Nebraska winds. It was decided that an aluminum channel with wiggle wire should have first been installed. This would have saved labor and time.

Savory Eats had originally intended to transplant the raspberries into the high tunnel in the fall of 2012. However, after consultation from Stacy Adams (UNL Horticulturalist), it was decided it would be best to wait until the spring of 2013 to move the plants.

The amount expended for the construction of the high tunnel totaled approximately $12,000.

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Additional Information

For more details regarding this project and the tours, please visit the Nebraska Our Best to You YouTube Channel at http://www.youtube.com/channel/UCUfhUcNUldN4_hf6attsvww.