HINTZ PRODUCE
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 was 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.

Hintz Produce 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, which was designed to increase their vegetable crop yield and lengthen the growing season for their specialty crops. This report is a description of Hintz Produce's high tunnel unit and how it will extend the season for Nebraska specialty crops. A primary goal of this project was to increase the season extension knowledge base among specialty crop producers and to encourage growers to consider adopting similar production methods into their own operations.

Project Approach and Goals and Outcomes Achieved

Hintz Produce is a small produce operation located near Hebron, Nebraska, which is a town located in southeast Nebraska. They have been in operation for 15 years and grow a wide

variety of produce (primarily tomatoes) on approximately 4 acres of land. Their produce is sold at the Hebron Farmers' Market.

Topographically, Hebron is located in an area of the state that is considered as the "Dissected Plains" region. The land is hilly with moderated to steep slopes, sharp ridge crests, and remnant of the old, nearly level plain. The Dissected Plains are old plains eroded by water and wind.

Hintz Produce applied for grant funds to build a high tunnel in an effort to provide a more stable weather environment for their specialty crops, especially tomatoes. There are a couple of reasons why Hintz Produce received high marks on their application.

1. There is a large number of Nebraska produce growers located in southeast Nebraska. Although NDA has over 500 produce growers in their database, a large number of growers are located in the eastern and southeastern potion of Nebraska. If timed right, the farm tour could attract a large number of growers.

2. High tunnels are becoming increasingly popular in an effort to extend the growing season and increase crop productivity.

The use of a high tunnel in vegetable production is becoming increasingly popular among produce growers. This popularity, coupled with a large concentration of growers in southeastern Nebraska, are some of the main reasons why this grower was awarded SCBGP grant funds.

Hintz Produce utilized grant funds to build a high tunnel in an effort to provide a more stable weather environment for the tomatoes. Such a unit would protect the operation from Nebraska's extreme weather conditions, and would allow for a more controlled climate environment. The tunnel would increase best management farming practices and would decrease the presence of fungus, bacterial wilt, and blight.

High tunnels are a simple, relatively inexpensive, and effective way of protecting high-value crops from the effects of marginal low temperatures, wind, rain, insect and foliar diseases, pests, and wildlife damage. There are 1.9 million acres covered with high tunnels worldwide. In the U.S., there are 4,400 acres, with 3,000 of those in California. While high tunnels have been increasing in northeastern states, they remain underutilized in Nebraska. There is ample opportunity for expanding high tunnel production, without saturating Nebraska markets. High tunnel growing offers season extension, yield and quality improvements, reduction in fertilizer leaching, reduction in costly pesticide and fungicide inputs, and quick payback on capital investment. They are an answer to many problems, if growers are willing to manage the technology. Daily raising and lowering of the plastic sides each morning and evening (sometimes more often) is required to control temperature and humidity.

Early crop production means capturing customers earlier in the season, keeping them season long with companion field production, and long into the fall. This results in higher sales, at reliably higher prices, from higher marketable yields per unit area. Providing

earlier, consistently available quality crops enables growers to successfully compete in several market outlets.

High tunnel costs and management are “scalable” meaning they offer equal “farm size neutral” benefits to small and large farms, rather than requiring a large farm economy of scale to realize benefits.

Hintz Produce’s high tunnel is 30 feet wide and 96 feet long, and was purchased from Morgan County Seeds. It is simply a large hoop house covered in plastic, with side end walls to be opened to regulate temperature. 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. The goal is to plant 200 tomato and 500 cucumber plants beneath the high tunnel in 2013. Sales of the produce over the course of two growing seasons should earn enough revenue to pay for the cost of purchasing the high tunnel, assuming there are no setbacks. Below is a breakdown as to how the total gross revenue is calculated.

1. If each tomato plant produces 15 pounds of tomatoes and the tomatoes are sold at $2 a pound, the total tomato revenue equates to $6,000 (200 plants x 15 lbs x 2/lbs).

2. If each cucumber plant produces 10 cucumbers and they are sold at 50 cents each, total cucumber sales would amount to $2,500 (500 plants x 10 cucumbers x $0.50 each).

Between the two crops, the tunnel would gross $8,500. This would nearly pay for the tunnel in the first year of high tunnel crop production.

In April 2012, a gardener’s meeting was held at Hintz Produce’s operation. During the meetings, Hintz explained how the tunnel could serve as a potential option for extending their growing seasons. The high tunnel would further supply the area with fresh produce for longer times during the year and, thus, serve as an economic boost to the community.

By May, it was apparent that the construction of the tunnel would not be completed before planting. Therefore, the construction was postponed and time was instead spent planting, installing drip tape, building a trellis system, and installing a weed barrier on the land where the high tunnel would eventually be built. From June – October, time was spent irrigating and harvesting the crop for sale at the Hebron Farmers’ Market on Saturday mornings. A small amount of produce was sold to a local food store in Hebron, Nebraska. In July, high tunnel construction resumed and the high tunnel bows were lifted and locked into position. The post clamps, bracing pipes, and base and hip boards were implemented in September, and the roof purlins were installed in October to stabilize the bows. In November, the construction of the end walls, side curtains, double doors, and the wiggle wire channels were finished. A warm, calm day was required to install the plastic on the tunnel before the temperatures become too cold. The goal was to finish the construction of the high tunnel by

the first two weeks of December. Unfortunately, the weather became too cold and the installation of the plastic was delayed until 2013.

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 Hebron, Nebraska, on July 19th. NDA worked with Hintz Produce to publicize this event. NDA sent 141 postcards to growers near the Hebron area encouraging them to attend. The postcards reached growers in 14 different counties. Additional postcards were sent to Hintz Produce 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 also posted on the *Nebraska Our Best to You* website. Growers were asked to RSVP to NDA by June 30th. An e-mail reminder was sent on July 10th to growers who received the announcement, had an e-mail address, but had not yet made a reservation. Approximately 22 RSVPs were received, 20 of whom attended the tour.

Lessons Learned

When this project began, the goal was to have it completed for use during the 2012 growing season. However, after evaluating the scope of the project, it was apparent that it was going to take more time and help than originally anticipated. Having never erected a high tunnel before, this task proved to be extremely difficult and challenging. A significant amount of time was spent reading instructions. Additionally, a few trips to Scandia, Kansas, were made to look at a similar high tunnel to see how it was erected. The Kansas grower provided some good advice and spent a couple of days helping Hintz Produce build parts of their high tunnel.

The 2012 growing season proved to be exceptionally hot and dry; therefore, maintaining crop production required a significant amount of time. Construction of the high tunnel was delayed due to time limitations.

If growers are wishing to install a high tunnel, Hintz Produce recommends a couple of suggestions.

1. Find an individual or a construction crew who can help build the high tunnel; or

2. Assist helping a friend erect their high tunnel before trying to build your own.

The plastic and side walls were installed in the spring of 2013. Tomatoes and cucumbers occupied most of the space within the tunnel. However, it is possible that some cooler weather plants, such as broccoli, cabbage, and spinach, can be planted in the early spring months. Hintz Produce hosted a farm tour on July 19, 2013, to teach Nebraska specialty crop farmers how the high tunnel was built. The tour addressed the challenges, obstacles, and opportunities encountered and how they could have been circumvented. The benefits and results were provided to demonstrate the affordability and practicality of the high tunnel.

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Additional Information

The amount expended to date for the construction of the high tunnel totaled approximately $10,100.

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