PRACTICAL farmers of Iowa

Healthy Food, Diverse Farms, Vibrant Communities

Blue Gate high tunnels record keeping project, winter, season 3

Written by Sally Worley

Cooperators
Jill Beebout and Sean Skeehan,
Chariton, Iowa

Project Timeline
August 2010 to March 2011

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Web Link
http://tinyurl.com/hightunnelrecords

Funding
The Ceres Foundation

Abstract

Jill Beebout and Sean Skeehan of Blue Gate Farm have kept records in their high tunnel for the past three seasons to create Iowa-specific scheduling and marketing information to determine which high tunnel crops generate the most revenue per square foot for their farm. This particular report focuses on the winter season with crops planted betweend August-October 2010 and harvested between November-March 2011. Gross revenue for this time period was $2644 and net revenue was $1860. The project has provided valuable information to Jill and Sean, who appreciate the controlled environment the high tunnels add to their farm. They plan to put up a third high tunnel and increase their covered growing area within the next two years.

About the Cooperator

Jill Beebout and Sean Skeehan operate Blue Gate Farm near Chariton, Iowa. Jill and Sean sell vegetables, honey, jam and free-range eggs via community supported agriculture (CSA), the Des Moines farmer's market and bi-weekly distributions direct to customers in Des Moines and Knoxville, via reservation, during the winter months.

Background

Jill Beebout and Sean Skeehan have kept records of their high tunnel crops as part of a PFI cooperators' project for the past three growing seasons. The objectives of the project have been to create Iowa-specific documentation of scheduling and marketing of a multitude of high tunnel crops and to determine which crops generate the most revenue per square foot for their farm.

High tunnels are gaining in popularity for fruit and vegetable growers. These structures, also known as passive solar greenhouses, are unheated structures that allow crops to grow in an extended season due to heat and solar retention. High tunnels also provide a protected environment, providing a buffer from conditions such as wind or torrential rain.

Inside a high tunnel at Blue Gate Farm near Chariton, Iowa.

High tunnels require a financial investment from the farmer of $3 to $5 per square foot, depending on the tunnel design (Spaw et al, 2004). Investment coupled with limited high tunnel space creates "high value real estate" inside high tunnels. It is important for growers to have good records to make informed decisions about how to maximize production and revenue in this valuable space.

This is a continuation of a research project conducted by Jill Beebout and Sean Skeehan that summarizes data from winter 2010-2011. The project is currently being continued to increase data points and validity of the information collected.

Method

Jill and Sean used two high tunnels for this project. High tunnel one is 26' x 48' x 12' with 4' roll-up sides (FarmTek Premium High Tunnel with 4' rib spacing). High tunnel two is 42' x 48' x 15' (FarmTek Colossal High Tunnel with 4' rib spacing). Both are covered by a double layer of plastic that is inflated by a fan to increase vigor and insulation. Details of the tunnels, including cost and materials used are available in the previous year's research report (http://practicalfarmers.org/assets/files/horticulture/on-farm/Blue_Gate_Spring_09.pdf).

Data were taken on: planting date, transplant date (if applicable), planting rate and total square feet of crop, irrigation, indoor and outdoor temperature and humidity, labor hours, harvest window, yield, quality and market price for each crop. Plant observations were recorded weekly.

Results and Discussion

Blue Gate Farm raised and took data on 13 crops in their high tunnels winter 2010-2011. ***Table 1*** *summarizes their overall sales from these crops. CSA revenue per crop equation: CSA revenue was calculated by multiplying the pounds sold through the CSA by unit price. Blue Gate Farm did not apply a 15% discount to the CSA products for their winter share like they did for their summer share because fresh, local produce is less abundant and worth a higher premium in the winter. Total revenue for Blue Gate Farm's winter CSA was $3,600. Sixty percent of that revenue came from high tunnel produce. Labor hours reflect all hours Blue Gate paid employees at $8/hour to plant, cultivate, harvest and process crops. Labor hours do not include Sean and Jill's labor, as they do not include their labor hours when calculating profit and loss for the farm.*

Table 1

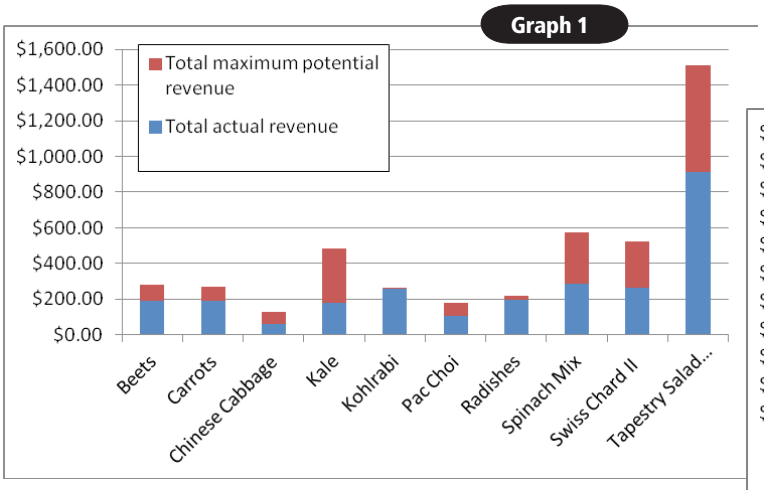
Overall net profit from high tunnel crops	
Direct sales gross revenue	$919
CSA gross revenue	$1,725
Total Gross Revenue generated from both HTs	$2,644
approximate seed expense	($100)
actual labor expense (total paid hours at $8)	($584)
misc exp	($10)
insurance/utilities	($90)
Total seasonal expense for both HTs:	($784)
Net HT revenue this field trial season (Nov 2010–March 2011):	$1,860

Appendix 1 *summarizes the 13 crops grown in the high tunnels. Varieties for each crop are listed in the appendix, and overall recorded harvest was a mix of the varieties rather than per variety for each crop. Contact Practical Farmers of Iowa for more detailed information about these crops.*

Seeding occurred from August 4 through October 4, transplanting from September 16 through October 8 and harvest from November 8 through March 16.

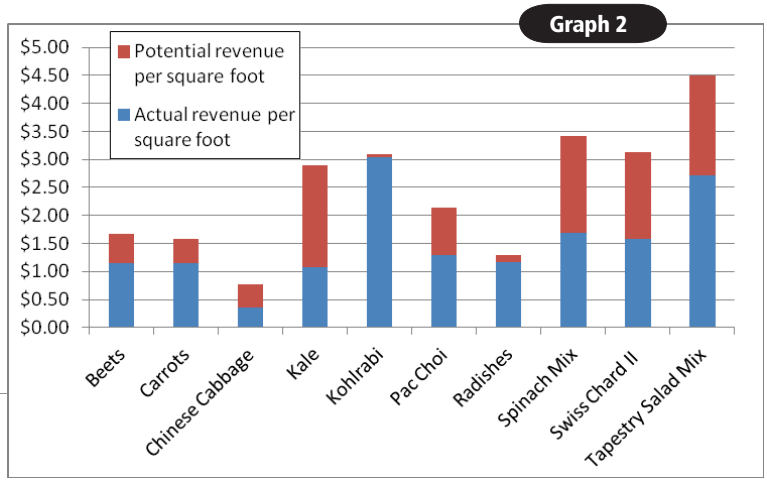
Net revenue equals total revenue minus labor cost and the percent of high tunnel costs in accordance with the amount of square feet planted. The cost of Jill and Sean's labor hours were included in this calculation, so the total net revenue varies

Graph 1



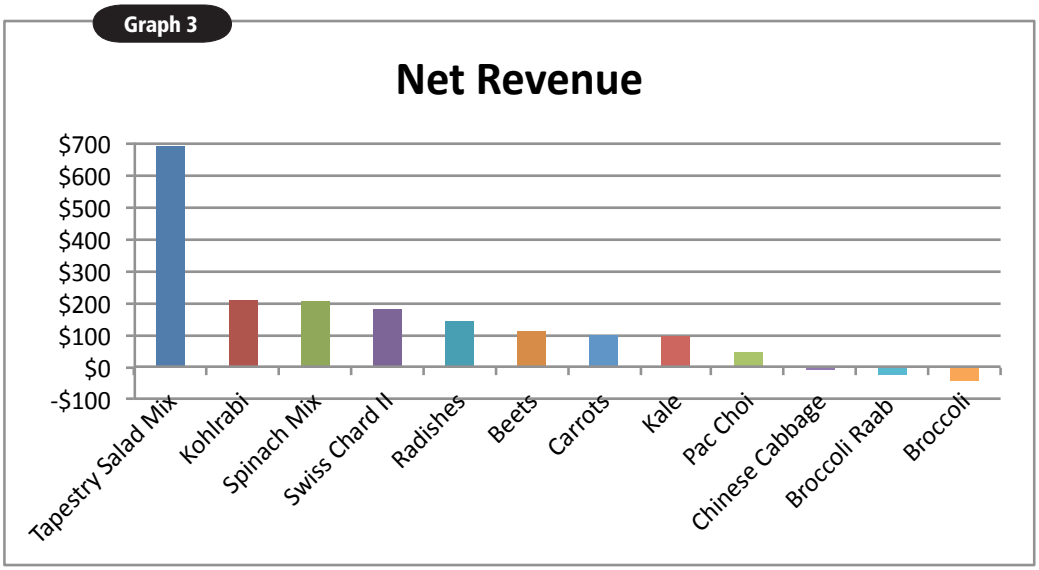
Graph 1 *shows the potential and actual revenue for each crop. Broccoli and broccoli raab are not listed because they did not head out and were not harvested. Potential revenue includes marketable items that did not sell as well as items that were not marketed due to factors such as rot and pest damage.*

Graph 2



Graph 2 *illustrates potential and actual yield for each crop per square food. This is the revenue for the overall growing season. Broccoli and broccoli raab are not listed because they did not head out and were not harvested.*

Graph 3



Graph 3 *illustrates net revenue for each crop with Jill and Sean's labor factored in.*

from the net revenue in where their labor is not included. Their hours are included in the appendix to better define the profit potential of individual crops.

Several crops were traded during market days for products from other vendors (this provided value to Blue Gate Farm but the value was not estimated); some were donated to a local soup kitchen (tax deductable for Blue Gate Farm). Trades and donations were not included in sold or unsold lbs. in the appendix.

Pac Choi sold at two different prices during the season according to size of unit; the lbs. unit price is an average of the entire high tunnel season.

Conclusion

Blue Gate Farm paid off the initial high tunnel investment with revenue generated from fall 2008. Subsequent years' net sales go toward farm business profit. Refer to past Blue Gate high tunnel recordkeeping projects for more information on revenue their high tunnels have generated over the past three years (http://practicalfarmers.org/assets/files/horticulture/on-farm/2010_Bluegate_report.pdf

http://practicalfarmers.org/assets/files/horticulture/on-farm/Blue_Gate_Spring_09.pdf

http://practicalfarmers.org/assets/files/horticulture/on-farm/High_Tunnels.pdf).

This three-year project has resulted in good data points for scheduling high tunnel crops in Iowa. Jill: Participating in this series of trials over the past three years has taught us the value of good data collection and helped inform us which crops provide the highest value for us in the high tunnel."

Sean: "The use of high tunnels at Blue Gate Farm is an integral part of our operations. The season extension we enjoy on both ends is tremendous. Having a portion of our produce offerings (many that are duplicated in the field) with irrigation and under cover from excess rain and wind has been a major advantage over the recent wet springs."

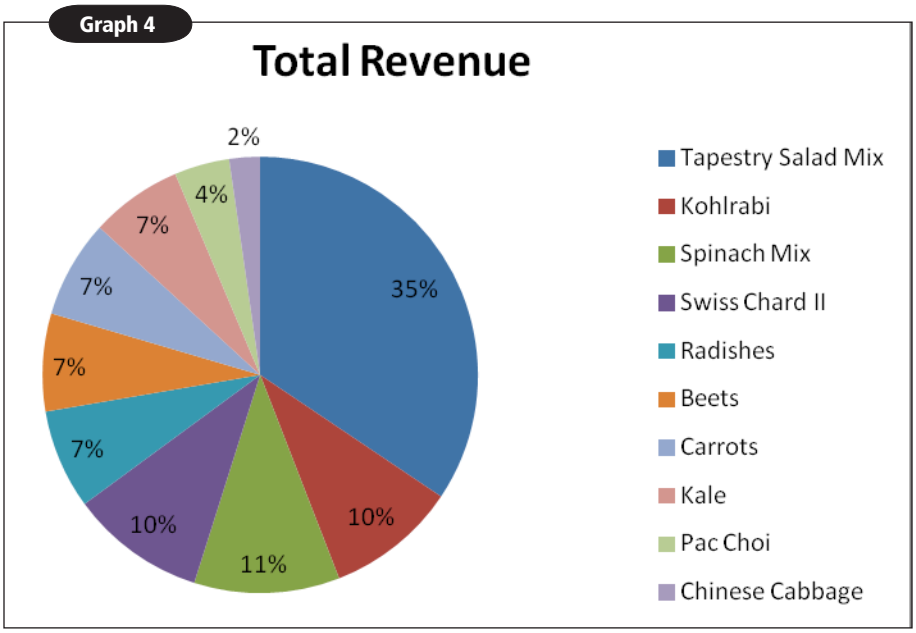
Jill warns that raising crops in high tunnels is management-intensive and complements but does not replace their field production: "High tunnels take management to properly control ventilation and problems with insects or disease can easily explode. We are currently developing plans to deal with salinization of tunnel's soil."

Jill and Sean plan to install a third high tunnel on their farm in the next two years.

References

Spaw, M. and K.A. Williams. 2004. Full Moon Farm Builds High Tunnels: A Case Study in Site Planning for Crop Structures. HortTechnology 14(3)92-95

Graph 4



Graph 4 *shows percent revenue by crop.*

Appendix 1

Overall net profit from high tunnel crops

Harvest Record Summary (All listed from HT1 and HT2, November 2010–March 2011)

Crop	Dates sow	transplant	pull	harvest range	total days in ground	lbs. marketable	lbs. unmarketable	total lbs. grown	sq. feet planted	lbs. yield per sq. foot	potential $ yield per sq. foot	actual $ yield per sq. foot	total maximum potential $	gross total actual $	$ varience	labor hours	net total actual $
Beets (Chioggia, Golden)	4-Oct-10	DS	15-Mar-11	11/8 - 12/20/10	162	81.0	24.0	105.0	168	0.48	$1.67	$1.14	$280.00	$192.00	$88.00	7.85	$111
Broccoli (Marathon)	4-Aug-10	8-Oct	15-Mar-11	n/a	158	0.0	0.0	0.0	84	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	4.25	-$43
Broccoli Raab (Piracicaba)	4-Oct-10	DS	15-Mar-11	n/a	162	0.0	0.0	0.0	84	0.00	$0.00	$0.00	$0.00	$0.00	$0.00	2.00	-$25
Carrots (Bolero, Napoli, Purple Haze, Rainbow)	3-Sep-10	DS	15-Mar-11	11/19 - 3/15/11	193	89.0	0.0	89.0	168	0.53	$1.59	$1.14	$267.00	$192.00	$75.00	9.50	$98
Chinese Cabbage (Rubicon)	4-Aug-10	8-Oct	15-Mar-11	12/20 - 2/15/11	158	34.0	0.0	34.0	168	0.20	$0.76	$0.36	$128.00	$60.24	$67.76	6.25	-$8
Kale (Beedy's, Red Russian, Toscano)	4-Aug-10	8-Oct	15-Mar-11	11/17 - 2/15/11	158	46.5	2.0	48.5	168	0.28	$2.89	$1.07	$485.00	$180.00	$305.00	8.25	$96
Kohlrabi (Eder, Kolibri)	4-Aug-10	24-Sep	15-Mar-11	11/24 - 12/21/10	172	64.0	1.0	65.0	84	0.76	$3.10	$3.05	$260.00	$256.00	$4.00	5.00	$207
Pac Choi (Fuyo Shomi & Red Choi)	4-Aug-10	24-Sep	15-Mar-11	11/8 - 12/7/10	172	70.0	50.0	120.0	84	0.83	$2.14	$1.29	$180.00	$108.00	$72.00	6.75	$45
Radishes (Heirloom mix, Cherryette, D'Avignon, White Icicle)	4-Oct-10	DS	15-Mar-11	11/8 - 12/7/10	162	43.0	2.0	45.0	168	0.26	$1.29	$1.16	$216.52	$195.34	$21.17	4.50	$141
Spinach Mix (Bordeaux, Olympia, Space, Tyee)	4-Oct-10	DS	15-Mar-11	11/8 - 3/15/11	162	52.5	5.0	57.5	168	0.31	$3.42	$1.70	$575.00	$285.00	$290.00	7.85	$204
Swiss Chard II (Bright Lights)	4-Aug-10	16-Sep	15-Mar-11	11/8 - 3/15/11	180	48.5	4.0	52.5	168	0.29	$3.13	$1.58	$525.00	$265.00	$260.00	8.25	$181
Tapestry Salad Mix (mesclun-type mix)	4-Oct-10	DS	1-Mar-11	11/8 - 3/15/11	148	93.0	15.0	108.0	336	0.28	$4.50	$2.71	$1,512.00	$910.00	$602.00	23.25	$688
TOTALS						622	103	531	1848		$2.04	$1.27	$4,429	$2,644	$1,785	93.70	$1,694
											average	average					

Appendix: *Overall net profit from high tunnel crops, listed from high tunnel 1 and high tunnel 2 for November 2010–March 2011*