Cooperators
Jill Beebout
Sean Skeehan

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March 2010 – October 2010

Web Link
www.practicalfarmers.org

Contact
Sally Worley, 515.232.5661
sally@practicalfarmers.org

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The Ceres Foundation

Blue Gate Farm High Tunnels: Take 3

Abstract

Jill Beebout and Sean Skeehan of Blue Gate Farm produce crops in the field as well as in two high tunnels. This report summarizes their production and sales data from their two high tunnels in spring and summer 2010. Fall 2008, spring and summer 2009 data is available at the web link on the left. Jill and Sean have recorded multi year data to create strong documentation for their high tunnel production and profit potential.

Blue Gate Farm generated significant profit from their high tunnels, and the structures were integral for their CSA and farmer's market sales in 2010 when their outdoor crops performed poorly due to adverse weather conditions.

This multi year project has re-enforced for Jill and Sean how beneficial accurate and easily accessible recordkeeping is for their farm.

Background

Season extension is popular among Iowa's fruit and vegetable producers. Season extension allows crops to be grown, harvested, and marketed outside of their normal growing season. This appeals to farmers because they can get price premiums by selling "off season." Getting revenue for a larger part of the year move evenly distributes their earnings. Season extension may also better distribute labor availability and labor demand throughout the entire year.

High tunnels are a common season extension example. High tunnels are an investment, so it is important that crops grown inside of the high tunnel create enough revenue to cover the costs of the structure as well as add income to the farm operation. Extensive studies have been done about high tunnel crop production, but very few have been conducted in Iowa. Season extension crop production, including scheduling and marketing, is site-specific, and growers need more information about Iowa's growing and selling climate in order to make informed decisions about the future of season extension in their operation.

The objectives of this project are to:

1. Create Iowa-specific documentation of scheduling and marketing of various crops in a high tunnel

2. Determine which crops bring in the most revenue per square foot

Method

Jill and Sean used two high tunnels for this project (shown above).

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. 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).

Jill and Sean collected data on: plant 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, amount of marketable harvest, amount of unmarketable harvest, quality and market price for each crop. Data was collected at least weekly. Data calculations included: net high tunnel revenue, highest revenue-generating crops, revenue per square foot, revenue per square foot per week, percent revenue per crop, and net revenue per crop. As is stated in the results, Jill and Sean's labor is not included in the overall high tunnel net revenue. This is because they do not include their labor costs, just their employees' labor costs, when calculating profit and loss for their farm. However, Jill and Sean's labor is factored in to net revenue per crop to better define profit potential for each crop.

Farm Cooperators

Jill Beebout and Sean Skeehan operate Blue Gate Farm in Chariton, Iowa. Jill and Sean sell vegetables, honey, jam, and free-range eggs via a CSA and the Des Moines farmers' market.

Results

Blue Gate Farm raised and took data on 27 crops in their high tunnels spring and summer 2010. Table 1 summarizes their overall sales from these crops.

Direct sales gross revenue	$5,185
CSA gross revenue**	$7,008
Total Gross Revenue generated from both high tunnels:	$12,194
approximate seed expense	($325)
approximate labor expense*	($3,158)
additional supply expense	($30)
insurance/utilities	($220)
Total seasonal expense for both HTs:	($3,733)
Net HT revenue this field trail season (May - Oct):	$8,460

* Labor included average wages/benefits paid at $8/hour to their paid employee. Jill and Sean did not include their labor hours in the labor expense calculation, as they do not include their labor hours in profit and loss calculations for the farm.

**CSA revenue was calculated at 85% of retail price.

Appendix 1 and 2 summarize the 27 crops grown in the high tunnel. Contact Sally for more detailed information about these crops. Seeding occurred from March 1 through August 4, transplanting from May 5 through September 16, and harvest from April 24 through October 30. The second planting of Swiss chard was harvested more after this data collection period, and is still in the ground of their tunnel to be harvested spring 2011. Swiss chard also overwintered from a fall 2009 planting and was harvested in conjunction with the spring planted Swiss chard. 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 from the net revenue above where their labor hours aren't included. Their hours are included in the summary appendix to better define the profitability potential of individual crops.

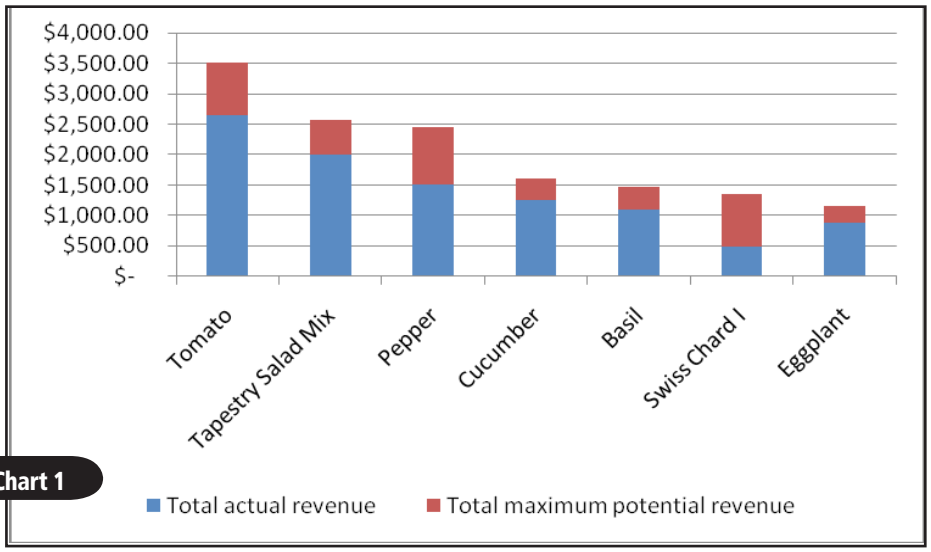

Chart 1

Chart 1 shows the top seven revenue-generating crops. Varieties were grouped by crop type to calculate revenue totals. However, succession plantings of crops were kept separate. 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. Jill observed the worst pest damage by insects in the high tunnel this season. In particular, an unidentified caterpillar consumed a large amount of fruiting produce.

Chart 2

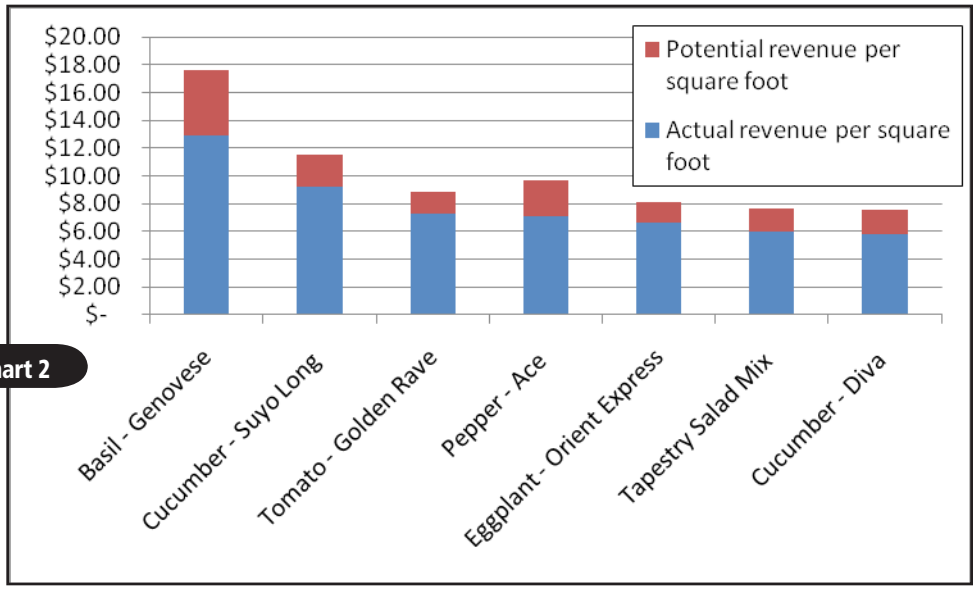

Chart 2 illustrates the crops that rated highest for actual yield per square foot, and includes their potential yield per square foot. This is the revenue for the overall growing season. There was wide variance between varieties, so they were kept separate for this chart.

Chart 3

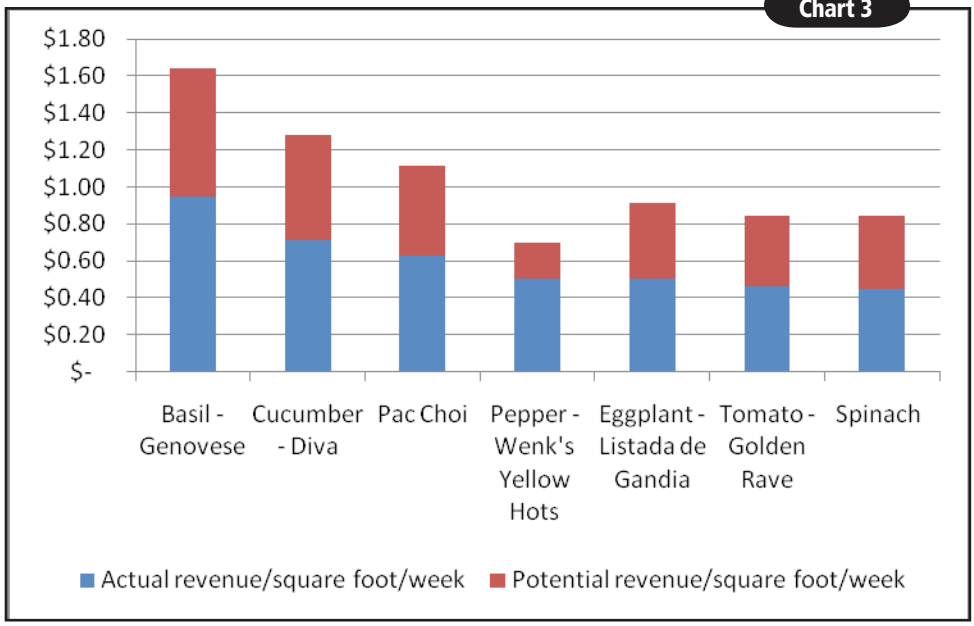

Chart 3 illustrates the seven crop varieties with the highest actual and potential revenue per square foot per week. This data was figured based on time in the high tunnel, so date of transplant or direct sow.

Chart 4

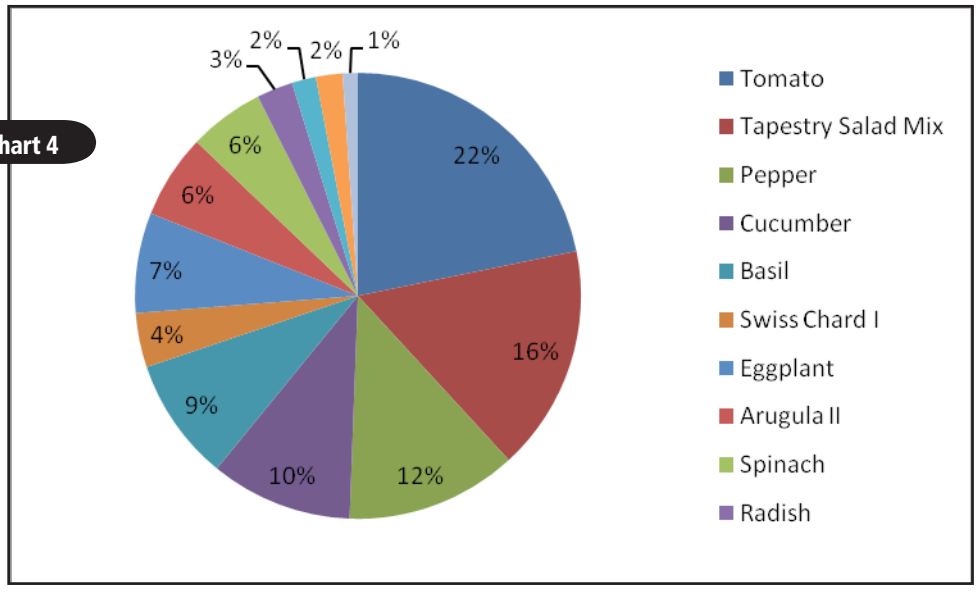

Chart 4 shows percent revenue by crop. Varieties were combined for this calculation.

Conclusions

Blue Gate Farms paid off the initial high tunnel investment with revenue generated from fall 2008; spring, summer and winter 2009 high tunnel sales, net sales in 2010 and beyond will be profits for the farm business.

For the last three seasons, due to inclement weather, the high tunnel not only provided Jill and Sean with an additional income source for high value crops it also allowed them to manage their risk since field production was extremely poor. "Had we not had the high tunnels and been running them so intensively, we would have had to close the CSA down this past summer," stated Jill Beebout.

Jill finds there is higher yield in the high tunnel than in the field. However, she warns that it is a two way street: "High tunnels amplify everything, both the good and the bad. While I never want to be without a high tunnel, I would never want to grow exclusively in tunnels. For instance, if you have an insect infestation, it creates a serious problem immediately. Things like aphid, white fly, or the obnoxious caterpillar we had this year, can annihilate high tunnel crops." While Blue Gate has healthy lacewing and ladybug populations to combat some high tunnel pests, insects and disease that make it to the high tunnel cause damage: "As soon as a pest makes it to the high tunnel, it explodes. It's hard to get ahead once you have them. The protected environment is healthy for the crops, but for the pests as well."

Crop rotation is complicated in the high tunnel because there is a limited area to work in, but Jill and Sean have found it to be manageable. Jill: "The solanums are our biggest challenge but only growing them one out of three growing seasons—only mid-season, not early or late—helps this challenge. The cucumbers pose the same challenge since we use the center bed with the high tunnel support posts, and the greatest height. Hopefully by aggressively amending the beds and keeping a variety of other crops growing in the beds the remainder of the season we can ward off too many problems. Having the two tunnels to rotate between also helps."

For Jill and Sean, this intensive trial has really highlighted the need for detailed and ongoing record keeping. Jill: "I'd always felt like we were fairly organized about having our information documented, but it wasn't always in the most usable form and I'd have to dig to come up with what I needed. The vigorous documentation required for this trial really emphasized the usefulness of having easily accessible information."

Appendix 1

Crop	Sow date	Transplant date	Date pulled	Harvest date range
Arugula I	3/23		6/9	4/30-5/28
Arugula II	7/7		10/7	8/3-10/30
Basil - Genovese	3/17	5/30	10/7	6/22 - 10/1
Pac Choi - Fuyo Shomi & Red Choi	3/17		6/9	4/30 - 6/4
Cucumber - Diva (market-type)	4/18	5/26	9/16	7/1 - 9/16
Cucumber - Suyo Long (Asian-type)	4/18	5/26	9/16	7/2 - 9/16
Eggplant - Listada de Gandia	3/1	6/2	9/23	7/3 - 9/21
Eggplant - Orient Express	3/1	6/2	9/23	6/23 - 9/21
Eggplant - Ping Tung Long	3/1	6/2	9/2	7/22 - 9/2
Eggplant - Rosa Bianca	3/1	6/2	9/2	7/26 - 8/31
Pepper - Ace (green to red Bell)	3/1	5/5	10/4	6/29 - 10/4
Pepper - Golden Marconi (green to yellow Italian long)	3/1	5/5	10/4	7/23 - 10/4
Pepper - Islander (purple Bell)	3/1	6/9	10/4	7/13 -10/4
Pepper - Sunray (yellow Bell)	3/1	6/9	10/4	7/29 -10/4
Pepper - Wenk's Yellow Hots (heir-loom yellow hot)	3/1	5/5	10/4	7/8 -10/4
Radishes (Easter Egg II, Cherryette, D'Avignon & White Icicle)	3/22		6/2	4/30 - 5/28
Spinach (mix of Bordeaux, Tyee & Olympia)	3/23		6/2	4/30-6/4
Swiss Chard I - Bright Lights	3/15		9/2	4/29 - 6/15
Swiss Chard II - Bright Lights	8/4	9/16	6/9	10/22 - 10/30
Tapestry Salad Mix (mesclun-type mix)	3/23		10/27	4/24 - 6/7
Tomato - Azoycha	3/8	5/26	9/23	7/22 - 10/5
Tomato - Dr. Wychee	3/8	5/26	9/23	7/3 - 9/23
Tomato - Golden Rave	3/8	5/26	10/7	7/17 - 10/5
Tomato - Japanese Black Trifele	3/8	5/26	10/7	7/17 - 10/5
Tomato - Juliet	3/8	5/26	9/23	7/9 - 10/5
Tomato - Mule Team	3/8	5/26	9/23	7/3 - 10/4
Tomato - Redfield Beauty	3/8	5/26	9/23	7/9 - 9/23

Appendix 2

Crop	Lbs marketable	Lbs unmarketable	Square feet planted	Yield per square foot (lbs)	Potential revenue per square foot	Actual revenue per square foot	Total maximum potential revenue	Gross actual revenue	Labor hours	Net revenue
Arugula I	28.5	4.3	168	0.17	$1.95	$1.40	$327.75	$235.00	11	$115.92
Arugula II	87.5	0.0	168	0.52	$5.21	$4.43	$875.00	$743.75	11.5	$620.67
Basil - Genovese	184.8	0.0	84	2.20	$17.59	$12.95	$1,477.63	$1,087.45	34.25	$797.91
Pac Choi - Fuyo Shomi & Red Choi	190.0	0.0	168	1.13	$2.35	$1.27	$394.17	$212.77	10.75	$95.69
Cucumber - Diva (market-type)	366.5	29.2	84	4.36	$7.56	$5.80	$635.41	$486.94	29	$239.40
Cucumber - Suyo Long (Asian-type)	403.3	64.3	84	4.80	$11.53	$9.17	$968.69	$770.00	29	$522.46
Eggplant - Listada de Gandia	129.4	9.0	84	1.54	$2.92	$2.49	$245.11	$208.96	31.25	$(56.58)
Eggplant - Orient Express	230.8	16.6	84	2.75	$8.14	$6.65	$683.51	$558.27	36.25	$252.73
Eggplant - Ping Tung Long	24.0	15.7	84	0.29	$2.05	$1.06	$172.58	$88.70	13	$(30.84)
Eggplant - Rosa Bianca	18.2	7.8	84	0.22	$0.60	$0.36	$50.21	$29.89	11	$(73.65)
Pepper - Ace (green to red Bell)	196.8	22.7	84	2.34	$9.67	$7.06	$812.62	$593.46	30	$337.92
Pepper - Golden Marconi (green to yellow Italian long)	66.0	10.1	42	1.57	$8.52	$4.81	$358.03	$202.22	24.75	$(3.55)
Pepper - Islander (purple Bell)	88.0	23.6	84	1.05	$5.71	$3.44	$479.87	$288.80	22.25	$95.26
Pepper - Sunray (yellow Bell)	62.5	10.9	84	0.74	$4.10	$3.00	$344.33	$252.16	20.5	$72.62
Pepper - Wenk's Yellow Hots (heirloom yellow hot)	53.8	5.4	42	1.28	$10.97	$4.24	$460.56	$178.26	26.75	$(43.51)
Radishes (Easter Egg II, Cherry-ette, D'Avignon & White Icicle)	113.5	0.0	168	0.68	$2.40	$ 1.91	$403.38	$320.56	9	$217.48
Spinach (mix of Bordeaux, Tyee & Olympia)	76.5	0.0	168	0.46	$4.55	$3.96	$765.00	$666.00	14.5	$518.92
Swiss Chard I - Bright Lights	56.8	78.0	168	0.34	$8.02	$2.86	$1,347.50	$480.75	16.5	$317.67
Swiss Chard II - Bright Lights	20.5	0.0	168	0.12	$1.22	$0.80	$205.00	$135.00	4.5	$67.92
Tapestry Salad Mix (mesclun-type mix)	183.0	0.5	336	0.54	$7.65	$5.95	$2,569.00	$1,998.50	40.75	$1,610.34
Tomato - Azoycha	259.8	41.8	168	1.55	$5.39	$3.94	$904.74	$662.39	37.75	$329.31
Tomato - Dr. Wychee	112.6	25.4	84	1.34	$4.93	$3.42	$414.00	$287.13	29.75	$33.59
Tomato - Golden Rave	176.1	9.2	84	2.10	$8.82	$7.31	$741.20	$614.02	37.25	$300.48
Tomato - Japanese Black Trifele	150.8	14.3	84	1.80	$5.90	$ 4.58	$495.30	$384.54	34.75	$91.00
Tomato - Juliet	142.6	4.4	84	1.70	$7.00	$5.45	$587.72	$458.15	37	$146.61
Tomato - Mule Team	58.6	10.2	84	0.70	$2.46	$1.78	$206.52	$149.53	26.25	$(76.01)
Tomato - Redfield Beauty	39.4	13.7	84	0.47	$1.90	$1.20	$159.36	$100.52	28.75	$ (145.02)
TOTALS	**3520.2**	**417.0**	**3108**		**$5.89** *average*	**$4.12** *average*	**$17,084.20**	**$12,193.72**	**658**	**$6,354.74**