**Horticulture Research**

**Enterprise Budget for Cherry Tomatoes**

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**Cooperators:**
- Ann Franzenburg - Van Horne
- Emma Johnson - Central City

**Funding By:**
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Ceres Season Extension

**Web Link:**

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**In a Nutshell**

- Two farmers provided enterprise budgets for cherry tomato production in 2017.
- Cherry tomatoes were grown in a heated greenhouse (Ann Franzenburg), and an unheated high tunnel (Emma Johnson).
- Revenue and expenses, including a breakdown of labor, was reported by each farmer.

**Key Findings**

- Labor was the largest expense for both Franzenburg and Johnson, accounting for 62% and 68% of their total expenses, respectively.
- Harvesting and packing was the most time-consuming task on both farms, accounting for 74% of labor-hours at Franzenburg and 62% of labor-hours at Johnson.
- Both farms had profitable cherry tomato crops, netting $1.31/lb at Franzenburg and $1.54/lb at Johnson.

**Project Timeline:**
March 2017 - November 2017

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**Background**

In past years, Practical Farmers’ research cooperators have done enterprise budgets in high tunnels (Worley et al., 2011, 2012). In 2015, three farmers – Ann Franzenburg, Emma Johnson, and Jan Libbey – began tracking their enterprise budgets for cucumbers in the greenhouse, high tunnel and field. They collected and reported expense and revenue data for 2015 and 2016, producing two years of research reports on cucumber enterprise budgets.

Cherry tomatoes at Johnson.

(Kolbe et al., 2015; Kolbe et al., 2016). They found the results were useful to their bottom line and improved farmer-to-farmer conversations about production and marketing. Mostly, it helped them focus on finding and discussing labor inefficiencies.

Franzenburg and Johnson identified the next target crop as cherry tomatoes – a popular item at markets, but another one with high labor costs.

University extension programs also offer enterprise budgets examples for tomatoes, but not many for cherry tomatoes. Iowa State University’s Chase and Naeve (2013) provide a high tunnel budget example with slicer tomatoes, breaking down expenses and labor, showing a net income of $3.14/ft². A 2007 case study between the University of Vermont and Intervale Community Farm showed a net return of $2.11/ft²; again, for red slicers (University of Vermont Extension, 2007.)

While these studies are valuable, producers in the present study still had questions about the differences in their variety choices and management decisions, and how those variations by farm impacted the bottom line. Farmers also question the high net returns shown in some university studies. The breakdown of labor by task in this study – for high tunnel and greenhouse – is of particular interest.

**Objectives:**

1. Determine differences in enterprise budgets for cherry tomato in the greenhouse and high tunnel at two farms.
2. Determine differences in labor efficiency for various tasks.
Methods

Each farm planted and managed cherry tomatoes according to their own timing, markets and preferred practices. Data collected from each farm was standardized to provide insight into cost and labor efficiency at each farm. Planting and management details can be found in Table 1. Both farmers tracked data on cherry tomatoes raised in structures, which are trellised to maximize space and lengthen the harvest window. Both growers used drip irrigation.

At Pheasant Run Farm near Van Horne in Benton County, Ann Franzenburg trellised cherry tomatoes in her heated greenhouse with orange twine and plastic vine clips. She grows Sun Gold cherry tomatoes; a tangerine-orange colored F1-hybrid, noted for their sweet flavor. Johnny’s Seeds highlights them as an “easy choice,” especially for local markets (Johnny’s Seeds, 2017). Ann sells primarily to grocery and other retail stores.

Emma Johnson at Buffalo Ridge Orchard near Central City in Linn County grew four varieties of cherry tomatoes in an unheated, moveable high tunnel. Her varieties were: Black Cherry – a round, dark purple variety; Esterina – an F1-hybrid yellow-gold variety; Sakura – an F1-hybrid early red; and Sunpeach – an F1-hybrid pink fruit, which is a sister to Sun Gold (Johnny’s Seeds, 2017). Johnson trellised using nylon mesh and tomato clips. Johnson marketed cherry tomatoes through farmers market and institutional accounts, and distributed them in the farm’s CSA boxes.

Results and Discussion

Growing degree day information for both farms is available in Table 2. Weather in 2017 was acceptable for tomato production, though May and August were cooler than normal. Because the crops were indoors with drip irrigation, precipitation is not a factor in production.

![Brianna planting Sun Gold in the greenhouse with Tigger at Pheasant Run Farm (Franzenburg).](image)
Enterprise Budgets for Cherry Tomato Production

Net Income

Revenue, costs and net income were analyzed three ways: per pound sold, per pint sold and per square-foot in production. As seen in Figure 1, cherry tomatoes were profitable for both farms, and Johnson earned more net income per pound, per pint and per square-foot compared to Franzenburg. The two farms were similar in their net income per pound, with Johnson netting $1.54/lb compared to Franzenburg’s $1.31/lb. This ratio is the same as per pint, as both farms assume pints weigh 0.75 lb. Per square-foot, there was a larger difference in net income. Johnson earned $2.64/ ft^2, while Franzenburg netted $1.14/ft^2).

Yield and Revenue

Looking at the enterprise budgets in Table 3, differences in yield and expense categories begin to emerge. Johnson harvested nearly twice as much fruit per square-foot (1.71 lb/ft^2) as Franzenburg (0.87 lb/ft^2), despite harvesting for six fewer weeks than Franzenburg. Johnson thought this yield difference could be due in part to differences in fruit size; Sun Gold is a smaller variety, about 15-20 g per fruit. Sakura, which was over half of Johnson’s crop, is 20-22 g/fruit. Taken at the extremes, the difference in fruit size is 30%.

Franzenburg’s overall revenue was higher per pound and per pint; she averaged $2.81/pt in revenue compared to $1.98/pt for Johnson (Table 3). Johnson noted the difference in revenue per unit received between the farms, and the difference was likely related to their markets. “We sell some cherry tomatoes at farmers market,” she said, “but we grow them for wholesale and we sell them to wholesale, which is why our price is so low.”

![Emma Johnson preparing to weigh cherry tomatoes.](image)
Production Costs

Labor cost (at $10-15/hr) was the largest contributor to production costs at both farms. For Franzenburg, labor cost accounted for 62% of total costs; for Johnson labor cost was 68% of total costs. Looking beyond labor, the breakdown of cost categories varied by farm. This breakdown can be seen in actual dollar amounts in Table 3, and by percent in Figure 2. For Franzenburg, the remaining costs fall mostly into marketing, building/structures and field supplies (Figure 2). Marketing supplies includes clamshell boxes, which are required for selling to grocery stores, and fuel for greenhouse heat. Johnson’s costs are largely field supplies, and half of that cost is straw bales used for mulching beds and walkways.

Overall, Franzenburg had the highest costs per pound, pint, and square-foot (Table 3), and as a result had lower net income (even with higher revenue). Both farms had strong net income ratios for their cherry tomatoes; 0.35 for Franzenburg and 0.59 for Johnson (Table 3). According to Iowa State University, net income ratios of 0.35 and higher are considered excellent (Chase, 2012).

Labor for Cherry Tomato Production

As discussed in the enterprise budget section, labor is the primary cost for each farm’s cherry tomato production. Are these hours well spent? Figure 3 provides the gross revenue and net income per labor-hour by farm. Gross revenue per labor-hour, shown in red, ranges from $35.60 for Johnson to $25.40 for Franzenburg, while net income ranges from $20.80 per labor-hour for Johnson to $8.90 for Franzenburg. Gauging by these numbers, both farms are profitably using their time, but they are still focused on ways to be more efficient with their time.
“We were really concerned about the amount of labor for cherry tomatoes; especially the time spent harvesting,” said Johnson. By percent of total labor-hours at each farm, harvesting and packing accounted for the bulk of labor with cherry tomatoes (Figure 4). On Franzenburg’s farm, harvesting and packing accounted for 74% of the total labor; at Johnson’s harvesting and packing was 62% of total labor hours. “My mom does a lot of the harvesting, and she is a machine,” said Johnson. “Other people would not work as efficiently; she picks a flat – about 20 pounds – in an hour. We pick into a harness and then transfer to flats.” Johnson’s farm harvested 33 times over 12 weeks; Franzenburg harvested 32 times over 18 weeks, beginning 3 weeks earlier than Johnson and ending 3 weeks later (Oct. 29).

Johnson did note that the Sakura was more difficult to harvest than other varieties because the stems did not detach easily from the fruits. “Mom said she could harvest the other varieties more quickly than Sakura because of the stems. Though they were very crack resistant, Sakura did tend to crack if you had to manually remove the stem. If we knew we were taking the cherry tomatoes to farmers market and not selling them wholesale, we just left the stems on,” said Johnson.

Franzenburg also commented on stem issues. “Sun Gold are the ultimate local food – they’re sweet and delicious, and too delicate to ship,” she said. Sun Gold do have a tendency to crack; especially later in the season, Franzenburg noted. “Later in the season, the stems hang on a little tighter, and you basically have to use two hands to remove them gently. I can usually tell if one is going to crack, and just pop that one in my mouth and move on,” she said. This is her third season growing Sun Gold, and she plans to continue with them. “One of the great things about Sun Gold is its steady fruiting; I pretty much know every week that I will have a certain number of pints. We used to grow Five Star Grape and found that a lot of the fruit came on all at once, flooding us with grape tomatoes for a couple weeks and then production dropped off.” She also commented on the vigor of the plants, “We pruned the Sun Gold really hard this year. As we cut them back, we’d get larger fruits.”

Johnson trellised cherry tomatoes using netting hung from the high tunnel purlins; trellising and pruning accounted for 20% of her farm’s cherry tomato labor-hours. Field maintenance, including bed-making, moving the hoophouse, irrigation set-up, fertilizer, and pest management accounted for 13% percent of the labor.

At Franzenburg’s, most of the labor was in harvesting and packing (74% of total labor), which also included putting tomatoes into clamshell pints and adding an “Organic” sticker. Franzenburg noted that she had new, young workers this year. “Inexperienced workers average 5 minutes per pint for harvest and packing into clamshells,” Franzenburg said. “Fast workers can easily do 12 pints in half an hour – half the time.” Trellising and pruning took 11% of Franzenburg’s labor, and field maintenance and prep accounted for 12% of labor hours. A detailed breakdown of labor-hours can be found in Table 4.

**Table 4**

<table>
<thead>
<tr>
<th>Farm</th>
<th>Category</th>
<th>Hours</th>
<th>Annual Cost</th>
<th>% of Total Labor</th>
<th>Min./lb</th>
<th>Min./pint</th>
<th>Min./ft²</th>
<th>$/lb</th>
<th>$/pint</th>
<th>$/ft²</th>
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<td><strong>Franzenburg</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td>Field Maintenance</td>
<td>15</td>
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<td>0.94</td>
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<td>Harvesting and Packing</td>
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<td>-</td>
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<td>0.00</td>
<td>0.00</td>
<td>0.00</td>
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<tr>
<td></td>
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<td>0.22</td>
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<td>0.05</td>
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<td>0.96</td>
<td>0.72</td>
<td>0.83</td>
<td>0.16</td>
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<td><strong>Total</strong></td>
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<td><strong>Johnson</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>0.01</td>
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<td>3.33</td>
<td>7.61</td>
<td>0.74</td>
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</table>
Averaging labor-hours over yield, number of pints and production area provides an interesting approach, in Figure 5. The farms were very similar in labor-time/ft², with Franzenburg at 7.71 min./ft² and Johnson at 7.61 min./ft². Per pound and per pint, however, Franzenburg’s labor is higher. This is likely due to the extra labor required for packing in pints, and potentially the increased time needed to fill volume with smaller fruits, and the difference in beginner vs. experienced labor (Franzenburg had some new employees).

Conclusions and Next Steps

Cherry tomatoes were a profitable crop at both farms, netting $1.31/lb at Franzenburg’s and $1.54/lb at Johnson’s. Labor was the highest expense for cherry tomatoes at both farms, and most of the labor-hours were used for harvesting and packing. Johnson had more efficient harvest, which earned them higher profits per pound and per square-foot.

Tomato variety matters. Johnson was disappointed with their old varieties, and the four varieties they grew in 2017 were new for them, chosen because of their resistance to cracking. “We needed some major changes to what we were doing. For many years we grew Bumble Bee varieties and last year we grew Tiger – they were delicious. But because they’re so sweet, they crack if you look at them. We stopped growing them cold-turkey. We probably won’t grow Sakura again because of the difficulty stemming, but they were very productive.”

Franzenburg noted that cracking in the Sun Gold was more common later in the season, but might have been exacerbated by an irregular watering schedule. “We stick to a very regular watering schedule through the summer, but as usual, things get hectic toward the end, especially when row crop harvest begins. Next year I might try to give the tomatoes a good watering the morning I plan to harvest and see if that makes a difference.”

Both farms plan to repeat the cherry tomato enterprise budget in 2018 to provide a two-year look at the crop’s production and profitability.

References


PFI Cooperators’ Program

PFI’s Cooperators’ Program gives farmers practical answers to questions they have about on-farm challenges through research, record-keeping, and demonstration projects. The Cooperators’ Program began in 1987 with farmers looking to save money through more judicious use of inputs. If you are interested in conducting an on-farm trial contact Stefan Gailans @ 515-232-5661 or stefan@practicalfarmers.org.