



Northern Utah High Tunnel Strawberry Production Costs and Returns, 2014

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Introduction

Sample costs and returns to produce strawberries in one high tunnel structure under drip irrigation and sold through direct markets are presented in this publication. This publication is intended to be a guide used to make production decisions, determine potential returns and prepare business and marketing plans. All practices, yields, costs, and pricing were determined through a research study conducted at Utah State University across a three-year period and are updated from those provided in Rowley, Black, and Feuz (2010). Practices, yields, costs, and pricing are not applicable to all situations as management, cultural practices, markets, and growing conditions vary across the region.

High Tunnel

This publication assumes use of a 14 x 96 foot high tunnel (see Black et al., 2008), using an annual hill system with fall-planted, June-bearing 'Chandler' strawberries. Although the costs and returns provided represent production in one high tunnel, it should be noted that 20 high tunnels can be accommodated on one acre of land (Ward, Drost, and Whyte, 2011).

Crop Pricing

As high tunnels move production earlier in the season, early yield was calculated as the total mass yield produced before non-protected field production begins. Early strawberries typically command price premiums over in-season production. When the field (unprotected) strawberries begin yielding, local supply increases and the total price per pound is lowered. In limited test

marketing in Logan, Utah, a \$1.50 per pound premium was common for the early, out-of-season strawberries. Based on interviews with strawberry growers in Utah, pricing was set at \$4.50 per pound for in season and \$6.00 per pound for early season strawberries sold through direct markets (see Table 1). Price per pound will vary by market and geographical area.

Calculated Yield

Yield data (quantity of 1 pound clamshells) were collected in North Logan, Utah, and averaged over a 3 year period. The one high tunnel produced 373 1 pound clamshells in the early season and 472 1 pound clamshells in the regular season (see Table 1). Over the three seasons, the field production season began between May 1 and May 12, typically 4 to 6 weeks later than the start of high tunnel production (Maughan et al., 2013).



Supplies

Production supplies were priced based on costs in Logan, Utah (Rowley, Black, and Drost, 2010) and may vary across regions. Plug plants are not commercially available in the Intermountain West and are not amenable to shipping over long distances so must be either produced on site or contracted through a local nursery. Supplies ordered from online sources will have an additional shipping cost.

Hired Labor

Labor was priced at \$10 per hour. Quantity of hours needed per activity was recorded and averaged over the study period, although depending on tools and experience, time needed may vary.

Depreciation

Asset depreciation of the high tunnel was calculated using straight line depreciation and assumed no salvage value at the end of the useful life (Table 2). Total cost of investment was divided by number of years the asset is assumed to be useful resulting in the annual depreciation cost. High tunnel useful life is 6 years and the initial cost of the high tunnel was based on the low-cost high tunnel design used at Utah State University (Black et al., 2008). High tunnel cost will vary depending on design and materials used.

Straight Line Depreciation Computation

$$\left(\frac{\text{Purchase Price} - \text{Salvage Value}}{\text{Useful Life}} \right)$$

Summary of Results

As shown in Table 1, the net income resulting is \$1,944.27 per 96' high tunnel, or \$38,885.38 per acre assuming 20 tunnels.



References

- Black, B., D. Drost, D. Rowley, and R. Heflebower. 2008. Constructing a low-cost high tunnel. Utah State University Extension Bulletin HG/High Tunnels/2008-01pr. Utah State University, Logan, Utah. Online at: http://extension.usu.edu/files/publications/publication/HG_High_Tunnels_2008-01pr.pdf
- Maughan, T., B. Black, D. Drost, and K. Curtis. 2013. Optimizing Systems for Cold-Climate Strawberry Production. M.S. Thesis, Utah State University.
- Rowley, D., B.L. Black, and D. Drost. 2010. Strawberry plug plant production. USU Extension Fact Sheet Horticulture/Fruit/2010-01pr. Utah State University, Logan, Utah.
- Rowley, D., B. Black, and D. Feuz. 2010. High Tunnel June-bearing Strawberry Budget 2010, Based on a 14' x 96' High Tunnel. 2010 Utah Agriculture Statistics and Utah Department of Agriculture and Food Annual Report. p. 94.
- Ward, R., D. Drost, and A. Whyte. 2011. Assessing profitability of selected specialty crops grown in high tunnels. Journal of Agribusiness 29(1):41-58.

Table 1. High Tunnel June-bearing Strawberry Costs and Returns, 14' x 96' Tunnel.

	Units	Quantity	Price	Total
Revenues				
Early Out-of Season Strawberries	1 lb clamshells	373	\$6.00	\$2,238.70
In-Season Strawberries	1 lb clamshells	472	\$4.50	<u>\$2,122.61</u>
Total Revenues				\$4,361.31
Operating Expenses				
Supplies				
Preplant and preparation costs				
Soil test	Each	1	\$14.00	\$14.00
Fuel	Gallons	0.38	\$3.50	\$1.31
Preplant fertilizers and soil amendments	Pounds	2.25	\$15.00	\$33.75
Plastic mulch	Foot	281	\$0.05	\$14.06
Drip tape	Foot	576	\$0.05	\$28.80
Strawberry establishment and growth				
Plug plants	Each	743	\$0.26	\$193.05
20-20-20 water soluble fertilizer mix	Pounds	11.34	\$1.23	\$13.95
10-30-20 water soluble fertilizer mix	Pounds	2.84	\$1.49	\$4.22
Captan	Pounds	0.43	\$9.82	\$4.20
Thionex 50 W	Pounds	0.03	\$7.51	\$0.20
Strawberry harvest				
1 lb clamshells	Each	1033	\$0.25	\$258.19
Labor				
Preplant and preparation costs				
Soil test	Hours	0.5	\$10.00	\$5.00
Apply preplant fertilizers	Hours	0.75	\$10.00	\$7.50
Tillage	Hours	7.5	\$10.00	\$75.00
Form raised beds	Hours	13	\$10.00	\$130.00
Install drip tape	Hours	0.75	\$10.00	\$7.50
Cover with plastic mulch	Hours	1	\$10.00	\$10.00
Strawberry establishment and growth				
Planting labor	Hours	6	\$10.00	\$60.00
Fertigation	Hours	2	\$10.00	\$20.00
Pesticide applications	Hours	4.5	\$10.00	\$45.00
Hand weeding	Hours	4	\$10.00	\$40.00
Plastic and shade cloth install/removal	Hours	12	\$10.00	\$120.00
Monitoring and ventilation	Hours	30	\$10.00	\$300.00
Strawberry harvest				
Hand harvest	Hours	68	\$10.00	\$680.00
Post-harvest				
House clean out	Hours	4.5	\$10.00	\$45.00
Total Operating Expenses				\$2,110.73
Fixed Expenses (Depreciation)				
High Tunnel Annual				\$248.17
Irrigation System Annual				\$58.82
Total Fixed Expenses				\$306.98
Total Expenses				\$2,417.71
Net Income				\$1,944.27

Table 2. Annual Depreciation for High Tunnel and Irrigation System.

	Units	Useful Life (yrs)	Quantity	Price	Total
High Tunnel					
High Tunnel	Each	6	1	\$497.00	\$497.00
Initial Construction Labor	Hours	6	25	\$10.00	\$250.00
6 mil Greenhouse Film	24'x100' sheet 20' x 100'	3	2	\$221.00	\$442.00
Shade Cloth	piece	6	1	\$300.00	\$300.00
High Tunnel Total					\$1,489.00
Annual Depreciation Cost of High Tunnel					\$248.17
Irrigation system					
3/4" Poly Pipe	Foot	6	14	\$0.42	\$5.88
1" Valve	Each	6	1	\$5.15	\$5.15
Misc. Fittings	Each	6	10	\$1.00	\$10.00
Drip Hose Adapter	Each	6	6	\$0.56	\$3.36
Injector*	Each	6	1	\$265.00	\$265.00
Filter*	Each	6	1	\$12.50	\$12.50
Pressure Regulator*	Each	6	1	\$11.00	\$11.00
Installation Labor*	Hours	6	4	\$10.00	\$40.00
Irrigation System Total					\$352.89
Annual Depreciation Cost of Irrigation System					\$58.82
*May be used for multiple high tunnels					

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