2021–2022 COST ESTIMATES OF ESTABLISHING, PRODUCING, AND PACKING CORAL CHAMPAGNE SWEET CHERRIES IN WASHINGTON STATE

Preface

The results presented in this WSU publication serve as a general guide for evaluating the feasibility of producing Coral Champagne sweet cherries in Washington State in 2021–2022. This publication is not intended to be a definitive guide to production practices, but it is intended to be helpful in estimating the physical and financial requirements of comparable plantings. Specific budget assumptions were adopted for this study, but these assumptions may not represent the conditions in all production and marketing situations since production costs and returns vary across orchard operations, depending on the following factors:

- Capital, labor, and natural resources
- Crop yields
- Type and size of machinery, irrigation, and frost control systems
- Input prices
- Cultural practices
- Sweet cherry prices
- Orchard size
- Management skills

Cost estimations in the enterprise budget also vary depending on the budget's intended use. To avoid drawing unwarranted conclusions for any particular orchard, readers must closely examine the assumptions made in this guide and then adjust the costs, returns, or both as appropriate for their own orchard operation.

Coral Champagne Sweet Cherry Production in Washington State

Washington State is the number one producer of sweet cherries in the United States. In 2019, the gross value of sweet cherries was about $394 million, ranking it eighth in terms of overall value of agricultural commodities produced in the state (WSDA 2021).

Coral Champagne is a relatively new variety grown in Washington State but is widely produced in California (Hansen 2013). The fruit is a dark cherry, large, firm and juicy, and similar to Bing in overall flavor. It is an early-to-midseason sweet cherry variety that may ripen and be harvested about ten days ahead of Bing (Long et al. 2021; Van Well Nursery 2018).

Study Objectives

The primary use of this report is in identifying inputs, costs, and yields considered to be typical of well-managed Coral Champagne sweet cherry orchards.

This publication is designed to enable growers to estimate (1) the costs of equipment, materials, supplies, and labor required to establish and produce a Coral Champagne sweet cherry orchard, including packing costs, and (2) the ranges of price and yield at which Coral Champagne sweet cherry production would be a profitable enterprise.

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Information Sources

The data used in this study were collected from information shared by a group of experienced Coral Champagne cherry growers in Washington. Their production practices and input requirements form the baseline assumptions that were used to develop the enterprise budget. Additionally, the data represent what these owner-operators anticipate would occur over an orchard's life, if no unforeseen failures occur. Given that many factors affect production costs, packout, and returns, individual growers can use the Excel Workbook (available at the School of Economic Sciences Crop Enterprise Budgets) to make necessary modifications and estimate their own costs and returns.

Budget Assumptions

1. The area of the total farm operation is 300 acres. Bearing acres include 225 acres of apples (75% of total area), 48 acres of sweet cherries (16%), and 27 acres of pears (9%).
2. This budget is based on a 9-acre Coral Champagne sweet cherry block within a 300-acre orchard. It is assumed that 1 acre of this block is dedicated to roads, pond, loading area, buildings, etc., rather than to fruit production. Therefore, the total productive area for this block is 8 acres. Table 1 shows the assumed Coral Champagne block specifications, which are generally accepted among all growers interviewed.
3. The total value of bare agricultural land (including water rights) is $18,000 per acre with annual property taxes of $107 per acre.
4. The irrigation system consists of dual system drip irrigation and micro under-tree sprinkler system. Water is provided through a public irrigation district.
5. This study assumes that the pond, mainline, and pump already exist and that only the irrigation system and wind machine are newly installed.
6. Cultural practices and harvest activities are done by using a combination of manual labor, ladders, and labor-enhancing equipment. The hourly manual labor rate for 2021 is calculated using the Washington adverse wage rate for 2021 ($16.34/hour). In this analysis, we add 25% to reflect medical leave and all administrative costs for H2A employees, including housing, amounting to $20.43/hour. Activities such as chemical application, irrigation, and frost protection cost $21.68/hour (i.e., base of $17.34/hour plus 25%). Harvest labor rates follow the Department of Labor rates, plus 4% to account for mandated paid rest breaks. These labor rates are assumed the same for all years of production.
7. The gross price or gross return for Coral Champagne sweet cherries is $2.25/lb, which is the return before all expenses, including packing charges, are subtracted.
8. Average packout for Coral Champagne sweet cherries is 80%. Packout rate is determined by the amount of Coral Champagne cherries that can be packed for the primary (fresh) market divided by the amount of Coral Champagne cherries harvested.
9. Management is valued at $450 per acre.
10. Interest on investment represents a 5% opportunity cost to the enterprise. These are forgone earnings for investing money in orchard, equipment, and buildings rather than in an alternative activity. This also represents interest on funds borrowed to finance orchard, equipment, and building purchases.

Summary of Study Results

The estimated annual cost and returns for an eight-acre block of Coral Champagne sweet cherries in Washington are shown in Table 2. Production costs are classified into variable costs and fixed costs. Variable costs comprise orchard operations, harvest activities, materials, maintenance and repairs, and packing costs. Fixed costs are incurred whether or not sweet cherries are produced. These costs will generally be calculated for the whole farm enterprise and allocated across each unit of production. The fixed costs include depreciation on capital, interest, taxes, insurance, management, and amortized establishment costs. Management is treated as a fixed cost rather than a variable cost because, like land, management has been committed to the production cycle of the crop.

The study assumed that a Coral Champagne sweet cherry orchard could achieve full production in the sixth year. Based on the above assumptions, the total production costs for Coral Champagne sweet cherries during full production are estimated at $27,961 per acre. The net returns during full production are about $4,583 per acre. Table 3 shows the sensitivity of net returns to different combinations of price and yield. For this analysis, free on board (FOB) prices considered are $1.75–$2.75 per pound, and the net yields are 8,000–20,800 lb/acre given an 80% packout. A gross yield-price combination of 18,000 lb/acre or greater and $2.00/lb or higher would result in positive net returns for the owner-operator, based on the study's production and cost assumptions.

Table 4 shows the break-even return given different yield levels during full production. As of 2021, the break-even return for Coral Champagne cherries is estimated at $1.93/lb for a gross production of 18,000 lb/acre and 80% packout.

Table 1. Coral Champagne sweet cherry block specifications.

Architecture	Central leader, three-dimensional
In-row Spacing	6 feet
Between-row Spacing	12 feet
Rootstock	Gisela G12 rootstock
Productive Block Size	8 acres
Life of Planting	25 years
Tree Density	605 trees per acre
Trellis System	Vertical trellis

Table 2. Cost and returns per acre of establishing, producing, and packing Coral Champagne sweet cherries on a 12-acre block.

	Establishment Years					Full Production[a]
	Year 1	Year 2	Year 3	Year 4	Year 5	
Estimated Net Production, Fresh (lb/acre)[b]			4,800.00	8,000.00	11,200.00	14,400.00
Estimated Price, Fresh ($/lb)[c]			2.25	2.25	2.25	2.25
Estimated Net Production, Cull (lb/acre)			1,200.00	2,000.00	2,800.00	3,600.00
Estimated Price, Cull ($/lb)			0.04	0.04	0.04	0.04
Total Returns ($/acre)			10,848.00	18,080.00	25,312.00	32,544.00
Variable Costs ($/acre):						
Establishment						
Soil Preparation	2,437.52					
Trees (including labor)	8,667.50					
Orchard Activities:						
Pruning & Training[d]	204.30	715.05	1,021.50	1,225.80	1,225.80	817.20
Green Fruit Thinning[d]	0.00	0.00	0.00	0.00	0.00	0.00
Irrigation Labor[e]	108.40	151.76	151.76	195.12	195.12	195.12
Chemicals[e,f]	496.60	829.24	1,163.31	1,273.64	1,273.64	1,273.64
Monitoring & Testing[g]	66.00	66.00	206.00	206.00	206.00	228.00
Fertilizer[e,f]	74.62	148.25	222.65	247.34	247.34	247.34
Frost Protection (labor)[e]			16.26	16.26	16.26	16.26
Beehives			114.00	114.00	114.00	114.00
General Farm Labor[h]	225.00	225.00	225.00	225.00	225.00	225.00
Irrigation Water & Electric Charge	275.00	275.00	275.00	275.00	275.00	275.00
Drying Cherries[i]			350.00	350.00	350.00	350.00
Harvest Activities[j]						
Picking Labor			1,500.00	2,500.00	3,500.00	4,500.00
Other Labor (checkers, tractor drivers)			300.00	500.00	700.00	900.00

	Establishment Years					Full Production[a]
	Year 1	Year 2	Year 3	Year 4	Year 5	
Hauling			90.00	150.00	210.00	270.00
Warehouse Packing Charges[k]			3,600.00	6,000.00	8,400.00	10,800.00
Maintenance and Repairs						
Maintenance & Repair	200.00	200.00	235.00	235.00	235.00	235.00
Fuel & Lube	120.00	135.00	140.00	160.00	180.00	180.00
Other Variable Costs						
Crop Insurance			375.00	375.00	375.00	375.00
Overhead (5% of Variable Costs)[l]	643.75	137.26	499.27	702.41	886.41	1,050.08
Interest (5% of Variable Costs)[m]	675.93	144.13	524.24	737.53	930.73	826.94
Total Variable Costs	14,194.62	3,026.69	11,009.00	15,488.10	19,545.30	22,878.58
Fixed Costs ($/acre):						
Depreciation						
Irrigation System	128.33	128.33	128.33	128.33	128.33	128.33
Machinery, Equipment & Building	261.92	261.92	261.92	261.92	261.92	261.92
Mainline & Pump	0.00	0.00	0.00	0.00	0.00	0.00
Pond	0.00	0.00	0.00	0.00	0.00	0.00
Trellis	225.00	225.00	225.00	225.00	225.00	225.00
Wind Machine			120.46	120.46	120.46	120.46
Interest						
Irrigation System	96.25	96.25	96.25	96.25	96.25	96.25
Land[n]	900.00	900.00	900.00	900.00	900.00	900.00
Machinery, Equipment & Building	92.04	92.04	92.04	92.04	92.04	92.04
Mainline & Pump	0.00	0.00	0.00	0.00	0.00	0.00
Pond	0.00	0.00	0.00	0.00	0.00	0.00
Trellis	112.50	112.50	112.50	112.50	112.50	112.50
Wind Machine			90.35	90.35	90.35	90.35
Establishment Costs (5%)		842.03	1,167.77	1,377.05	1,459.15	
Other Fixed Costs						
Miscellaneous Supplies	190.00	190.00	190.00	190.00	190.00	190.00
Land & Property Taxes	110.00	110.00	110.00	110.00	110.00	110.00
Insurance Cost (all farm)	80.00	80.00	80.00	80.00	80.00	80.00
Management Cost	450.00	450.00	450.00	450.00	450.00	450.00
Amortized Establishment Costs[o]						2,225.31
Total Fixed Costs	2,646.04	3,488.07	4,024.62	4,233.90	4,316.00	5,082.17
TOTAL COSTS	16,840.66	6,514.76	15,033.62	19,722.00	23,861.30	27,960.74

	Establishment Years					Full Production[a]
	Year 1	Year 2	Year 3	Year 4	Year 5	
ESTIMATED NET RETURNS	(16,840.66)	(6,514.76)	(4,185.62)	(1,642.00)	1,450.70	4,583.26
Accumulated Establishment Costs	16,840.66	23,355.42	27,541.04	29,183.04	27,732.34	

[a] The full production year is representative of all the remaining years the orchard is in full production (Year 6 to Year 25).
[b] Estimated net production considers an average packout of 80%.
[c] Price reflects gross price or gross return (i.e., the return before all expenses, including packing charges, are subtracted).
[d] Hand labor rate is $20.43/hour and includes all applicable additional expenses.
[e] Tractor/machinery, irrigation, and frost protection labor rate is $21.68/hour and includes all applicable additional expenses.
[f] Includes materials and labor.
[g] Includes the cost of monitoring each tree for symptoms and cost of testing plant sample for little cherry virus and western X.
[h] General farm labor rate is a lump sum per acre and is applied to miscellaneous/all other labor. Rate includes applicable additional expenses.
[i] Cost of drying cherries (three weeks before harvest and one week during harvest) when cherries start to turn color.
[j] Picking rate = $0.20/lb. Checkers & tractor driver rate = $0.05/lb. Hauling rate = $0.02/lb.
[k] Warehouse packing charge = $0.60/lb.
[l] Captures indirect costs of operations in the orchard that fluctuate with the level of production but are not accounted for by the variable costs already identified. Also captures unforeseeable expenses.
[m] Interest expense on full year during establishment years and for three-quarters of a year during full production.
[n] Land cost is approximated by using the 5% interest rate multiplied by the land value of $18,000/acre.
[o] Represents the costs incurred during the establishment years (minus revenue during those years) that must be recaptured during the full production years. It is calculated as: accumulated establishment costs in Year 5 amortized at 5% for 20 years.

Table 3. Estimated net returns ($) per acre at various prices and yields of Coral Champagne during full production[a].

Gross Yield		**FOB Price ($/lb)[c]**				
(lb/acre)	**Net Yield (lb/acre)[b]**	**$1.55**	**$1.85**	**$2.15**	**$2.45**	**$2.75**
10,000	8,000	(5,907)	(3,907)	(1,907)	93	2,093
14,000	11,200	(4,262)	(1,462)	1,338	4,138	6,938
18,000	14,400	(2,617)	983	4,583	8,183	11,783
22,000	17,600	(972)	3,428	7,828	12,228	16,628
26,000	20,800	673	5,873	11,073	16,273	21,473
Overhead Cost	*5%*					
Interest Cost	*5%*					

Note: Shaded area denotes positive net returns based on the combination of net yield and price.
[a] Includes cull value. Culls comprise what remains after packing (20% of gross yield).
[b] Takes into account an average packout equivalent to 80%.
[c] Price represents gross FOB price (price before packing charges).

Table 4. Break-even return ($/lb) of Coral Champagne sweet cherries given different crop yield levels during full production.

Gross Yield (lb/acre)	**Net Yield (lb/acre)[a]**	**Break-even Return ($/lb)[b,c]**
10,000	8,000	2.49
14,000	11,200	2.13
18,000	14,400	1.93
22,000	17,600	1.81
26,000	20,800	1.72

[a] Accounts for an average packout of 80%.
[b] Includes cull value. Culls comprise what remains after packing (i.e., 20% of gross yield).
[c] This is the *total cost break-even return*. Only when this break-even return is received can the grower recover all out-of-pocket expenses plus opportunity costs. It is calculated as: *total cost minus the gross return of culls, then divided by net yield of fresh Coral Champagne cherries*. The calculation considers the gross yield and packout, and their associated harvest and packaging costs. For instance, if the gross yield during full production is 10,000 lb/acre, the net yield is 8,000 lb/acre given an 80% packout. Given this net yield, a return of approximately $2.49/lb must be received for the Coral Champagne sweet cherry enterprise to break even.

Most of the budget values given in Table 2 are based on more comprehensive underlying cost data, which are shown in Tables 5 through 8. Table 5 presents the annual capital requirements for an eight-acre Coral Champagne block. Table 6 specifies the machinery and building requirements for the 300-acre diverse cultivar orchard. Interest costs and depreciation are listed in Tables 7 and 8, respectively. Interest costs represent required return on investments. They can be actual interest payments on funds borrowed to finance farm operations and physical capital investments, an opportunity cost (a return that would have been received if the investment had been in an alternative activity), or a combination of the two. All interest and amortization costs assume a 5% interest rate. The amortized establishment costs assume a total productive life of 25 years, which includes 5 years of establishment and 20 years of full production. The amortized establishment costs must be recaptured during the full production years in order for an enterprise to be profitable. Depreciation costs are annual, noncash expenses that are calculated over the asset's useful life. These expenses represent the loss in an asset's value due to use, age, and obsolescence.

The key results of this enterprise budget are formed by production-related assumptions established for the study. Production costs and returns for individual owner-operators may differ; thus, the results cannot be generalized to represent the population of sweet cherry operations in Washington State. An interactive Excel Workbook, described below, is provided to enable individual owner-operators to estimate their returns based on the costs of their production.

2022 Updates

Key cost centers have increased as of 2022 compared to 2021, mainly hourly labor, propane and fuel, and fertilizer. This increase, coupled with weather events leading to a short crop size compared to previous years, compelled the inclusion of latest data in this publication.

On labor, the manual labor rate for 2022 is calculated using the Washington adverse wage rate for 2022 at $21.76/hour (that is, a base of 17.41/hour plus 25% to reflect medical leave and all administrative costs for H2A employees, including housing). The labor rate for activities such as chemical application, irrigation, and frost protection is $23.01/hour (i.e., base of $18.41/hour plus 25%). Harvest labor rates follow the Department of Labor rates, plus 4% to account for mandated paid rest breaks.

Other assumptions in calculating the costs and returns for 2022 are the same as for the 2021 study.

Table 9 shows the total production costs for Coral Champagne sweet cherries during full production, estimated at $28,482 per acre. The net returns during full production are about $4,062 per acre. Table 10 shows the sensitivity of net returns to different combinations of price and yields. A gross yield-price combination of 18,000 lb/acre or greater and $2.00/lb or higher would result in positive net returns for the owner-operator, based on the study's production and cost assumptions. The break-even price for Coral Champagne cherries as of 2022 is estimated at $1.97/lb, assuming 80% packout and a gross production of 18,000 lb/acre (Table 11).

Table 5. Summary of annual capital requirements for an eight-acre Coral Champagne sweet cherry block.

	Establishment Years					Full
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Production[a]**
Annual Requirements ($)						
Land (9 acres)	162,000					
Trellis System	36,000					
Irrigation System	30,800					
Mainline & Pump	-					
Pond	-					
Wind Machine			28,911			
Operating Expenses	120,197	30,853	94,712	130,545	163,002	189,669
Total Requirements ($)	348,997	30,853	123,623	130,545	163,002	189,669
Receipts ($)	-	-	86,784	144,640	202,496	260,352
Net Requirements ($)	348,997	30,853	36,839	(14,095)	(39,494)	(70,683)

[a] The full production year is representative of all the remaining years the orchard is in full production (Year 6 to Year 25).

Table 6. Machinery, equipment, and building requirements for a 300-acre diverse cultivar orchard.

	Purchase Price ($)[a]	Number of Units	Total Cost ($)
Housing for Manager	135,000	1	135,000
Machine Shop/Shed[b]	150,000	1	150,000
Tractor-70HP, 4WD	45,000	5	225,000
Tractor-40HP, 4WD	25,000	2	50,000
4-Wheeler	7,500	3	22,500
Speed Sprayer	25,000	5	125,000
Weed Spray Boom & Tank	7,000	1	7,000
Mower—Rotary (7 ft)	5,000	1	5,000
Flail Mower	8,000	1	8,000
Fork Lift	25,000	2	50,000
Bin Trailer	7,500	3	22,500
Pickup Truck	35,000	1	35,000
Ladder (8 ft)	100	100	10,000
Platforms	40,000	3	120,000
Miscellaneous Equipment[c]	50,000	1	50,000
Shop Equipment[d]	15,000	1	15,000
Total Cost			1,030,000

Notes: Machinery, equipment, and building requirements are utilized in growing diverse crops in the 300-acre farm, which includes Coral Champagne sweet cherries. The costs of fixed capital are allocated to the entire farm operation.

[a] Purchase price corresponds to new machinery, equipment, or building.

[b] Includes manager office, restroom, pesticide handling area and storage, dry storage, area for equipment cover, and shop bay for equipment work and repair.

[c] Includes two mobile portable toilets, box blade, straight blade, quick connect loader, mechanical weeder, detachable bucket for loading fertilizer, gopher baiter, soil aerator, utility trailer, and two ladder trailers.

[d] Includes compressor, welder, pressure washer, and miscellaneous tools.

Table 7. Annual interest costs per acre for an eight-acre Coral Champagne sweet cherry block ($/acre).

	Total Purchase Price ($)	Salvage Value ($)[a]	Number of Acres	Total Interest Cost ($)	Interest Cost per Acre ($)[b]
Irrigation System[c]	30,800	0	8	770	96.25
Land	162,000	N/A	9	8,100	900.00
Machinery, Equipment & Building[d,e]	1,030,000	74,500	300	27,613	92.04
Mainline & Pump[c]	0	0	8	0	0.00
Pond[c]	0	0	8	0	0.00
Trellis	36,000	0	8	900	112.50
Wind Machine[c]	28,911	0	8	723	90.35
Interest Rate	*5.0%*				

[a] Not applied to land because land is not a depreciable asset.

[b] Interest cost is calculated as: (Total Purchase Price + Salvage Value)/2 × Interest Rate. For land, the calculation is: Total Purchase Price × Interest Rate, because there is no salvage value for land.

[c] The irrigation system, mainline and pump, pond, trellis system, and wind machine are used for the direct production of the fruit. Hence, their respective interest costs are divided by the production area (8 acres) to get the interest cost per acre.

[d] Total area of the farm operation is 300 acres, and the machinery, equipment, and building are used in the entire farm. Thus, the corresponding interest costs are divided by the total area (300 acres) to derive the interest cost per acre.

[e] See Appendix 3 of the Excel Workbook at the Crop Enterprise Budget website for a detailed calculation of the salvage value of the machinery, equipment, and building.

Table 8. Annual depreciation costs per acre for an eight-acre Coral Champagne sweet cherry block ($/acre).

	Total Purchase Price ($)	Number of Acres	Total Value per Acre ($)	Years of Useful Life	Depreciation Cost per Acre ($/yr)[a]
Irrigation System	30,800	8	3,850.00	30	128.33
Mainline & Pump	0	8	0.00	30	0.00
Pond	0	8	0.00	50	0.00
Trellis	36,000	8	4,500.00	20	225.00

	Total Purchase Price ($)	Number of Acres	Total Value per Acre ($)	Years of Useful Life	Depreciation Cost per Acre ($/yr)[a]
Wind Machine	28,911	8	3,613.88	30	120.46
Machinery, Equipment & Building[b]					261.92

[a] The depreciation cost is calculated as straight-line depreciation: (Total Purchase Price – Salvage Value)/Years of Use.
[b] See Appendix 3 of the Excel Workbook on the Crop Enterprise Budget website for a calculation of the depreciation cost of the machinery, equipment, and building.

Table 9. 2022 cost and returns per acre of establishing, producing, and packing Coral Champagne sweet cherries on a 12-acre block.

	Establishment Years					Full Production[a]
	Year 1	Year 2	Year 3	Year 4	Year 5	
Estimated Net Production, Fresh (lb/acre)[b]			4,800.00	8,000.00	11,200.00	14,400.00
Estimated Price, Fresh ($/lb)[c]			2.25	2.25	2.25	2.25
Estimated Net Production, Cull (lb/acre)			1,200.00	2,000.00	2,800.00	3,600.00
Estimated Price, Cull ($/lb)			0.04	0.04	0.04	0.04
Total Returns ($/acre)			10,848.00	18,080.00	25,312.00	32,544.00
Variable Costs ($/acre):						
Establishment						
Soil Preparation	2,437.52					
Trees (including labor)	8,667.50					
Orchard Activities						
Pruning & Training[d]	204.30	715.05	1,021.50	1,225.80	1,225.80	817.20
Green Fruit Thinning[d]	0.00	0.00	0.00	0.00	0.00	0.00
Irrigation Labor[e]	108.40	151.76	151.76	195.12	195.12	195.12
Chemicals[e,f]	496.60	829.24	1,163.31	1,273.64	1,273.64	1,273.64
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Fertilizer[e,f]	74.62	148.25	222.65	247.34	247.34	247.34
Frost Protection (labor)[e]			16.26	16.26	16.26	16.26
Beehives			114.00	114.00	114.00	114.00
General Farm Labor[h]	225.00	225.00	225.00	225.00	225.00	225.00
Irrigation Water & Electric Charge	275.00	275.00	275.00	275.00	275.00	275.00
Drying Cherries[i]			350.00	350.00	350.00	350.00
Harvest Activities[j]						
Picking Labor			1,500.00	2,500.00	3,500.00	4,500.00
Other Labor (checkers, tractor drivers)			300.00	500.00	700.00	900.00
Hauling			90.00	150.00	210.00	270.00
Warehouse Packing Charges[k]			3,600.00	6,000.00	8,400.00	10,800.00
Maintenance and Repairs						
Maintenance & Repair	200.00	200.00	235.00	235.00	235.00	235.00
Fuel & Lube	120.00	135.00	140.00	160.00	180.00	180.00
Other Variable Costs						
Crop Insurance			375.00	375.00	375.00	375.00
Overhead (5% of Variable Costs)[l]	643.75	137.26	499.27	702.41	886.41	1,050.08
Interest (5% of Variable Costs)[m]	675.93	144.13	524.24	737.53	930.73	826.94
Total Variable Costs	14,194.62	3,026.69	11,009.00	15,488.10	19,545.30	22,878.58
Fixed Costs ($/acre)						

	Establishment Years					Full Production[a]
	Year 1	Year 2	Year 3	Year 4	Year 5	
Depreciation						
Irrigation System	128.33	128.33	128.33	128.33	128.33	128.33
Machinery, Equipment & Building	261.92	261.92	261.92	261.92	261.92	261.92
Mainline & Pump	0.00	0.00	0.00	0.00	0.00	0.00
Pond	0.00	0.00	0.00	0.00	0.00	0.00
Trellis	225.00	225.00	225.00	225.00	225.00	225.00
Wind Machine			120.46	120.46	120.46	120.46
Interest						
Irrigation System	96.25	96.25	96.25	96.25	96.25	96.25
Land[n]	900.00	900.00	900.00	900.00	900.00	900.00
Machinery, Equipment & Building	92.04	92.04	92.04	92.04	92.04	92.04
Mainline & Pump	0.00	0.00	0.00	0.00	0.00	0.00
Pond	0.00	0.00	0.00	0.00	0.00	0.00
Trellis	112.50	112.50	112.50	112.50	112.50	112.50
Wind Machine			90.35	90.35	90.35	90.35
Establishment Costs (5%)		842.03	1,167.77	1,377.05	1,459.15	
Other Fixed Costs						
Miscellaneous Supplies	190.00	190.00	190.00	190.00	190.00	190.00
Land & Property Taxes	110.00	110.00	110.00	110.00	110.00	110.00
Insurance Cost (all farm)	80.00	80.00	80.00	80.00	80.00	80.00
Management Cost	450.00	450.00	450.00	450.00	450.00	450.00
Amortized Establishment Costs[o]						2,225.31
Total Fixed Costs	2,646.04	3,488.07	4,024.62	4,233.90	4,316.00	5,082.17
TOTAL COSTS	16,840.66	6,514.76	15,033.62	19,722.00	23,861.30	27,960.74
ESTIMATED NET RETURNS	(16,840.66)	(6,514.76)	(4,185.62)	(1,642.00)	1,450.70	4,583.26
Accumulated Establishment Costs	16,840.66	23,355.42	27,541.04	29,183.04	27,732.34	

[a] The full production year is representative of all the remaining years the orchard is in full production (Year 6 to Year 25).
[b] Estimated net production considers an average packout of 80%.
[c] Price reflects gross price or gross return (i.e., the return before all expenses, including packing charges, are subtracted).
[d] Hand labor rate is $21.76/hour and includes all applicable additional expenses.
[e] Tractor/machinery, irrigation, and frost protection labor rate is $23.01/hour and includes all applicable additional expenses.
[f] Includes materials and labor.
[g] Includes the cost of monitoring each tree for symptoms and cost of testing plant sample for little cherry virus and western X.
[h] General farm labor rate is a lump sum per acre and is applied to miscellaneous/all other labor. Rate includes applicable additional expenses.
[i] Cost of drying cherries (three weeks before harvest and one week during harvest) when cherries start to turn color.
[j] Picking rate = $0.20/lb. Checkers & tractor driver rate = $0.05/lb. Hauling rate = $0.02/lb.
[k] Warehouse packing charge = $0.60/lb.
[l] Captures indirect costs of operations in the orchard that fluctuate with the level of production but are not accounted for by the variable costs already identified. Also captures unforeseeable expenses.
[m] Interest expense on full year during establishment years and for three-quarters of a year during full production.
[n] Land cost is approximated by using the 5% interest rate multiplied by the land value of $18,000/acre.
[o] Represents the costs incurred during the establishment years (minus revenue during those years) that must be recaptured during the full production years. It is calculated as: accumulated establishment costs in Year 5 amortized at 5% for 20 years.

Table 10. 2022 estimated net returns ($) per acre at various prices and yields of Coral Champagne during full production[a].

Gross Yield (lb/acre)	Net Yield (lb/acre)[b]	FOB Price ($/lb)[c]				
		$1.75	$2.00	$2.25	$2.50	$2.75
10,000	8,000	(6,428)	(4,428)	(2,428)	(428)	1,572
14,000	11,200	(4,783)	(1,983)	817	3,617	6,417
18,000	14,400	(3,138)	462	4,062	7,662	11,262
22,000	17,600	(1,493)	2,907	7,307	11,707	16,107
26,000	20,800	152	5,352	10,552	15,752	20,952
Overhead Cost	*5%*					
Interest Cost	*5%*					

Note: Shaded area denotes positive net returns based on the combination of net yield and price.

[a] Includes cull value. Culls comprise what remains after packing (20% of gross yield).

[b] Takes into account an average packout equivalent to 80%.

[c] Price represents gross FOB price (price before packing charges).

Table 11. 2022 break-even return ($/lb) of Coral Champagne sweet cherries given different crop yield levels during full production.

Gross Yield (lb/acre)	Net Yield (lb/acre)[a]	Break-even Return ($/lb)[b,c]
0,000	8,000	2.55
14,000	11,200	2.18
18,000	14,400	1.97
22,000	17,600	1.83
26,000	20,800	1.74

[a] Accounts for an average packout of 80%.

[b] Includes cull value. Culls comprise what remains after packing (i.e., 20% of gross yield).

[c] This is the *total cost break-even return*. Only when this break-even return is received can the grower recover all out-of-pocket expenses plus opportunity costs. It is calculated as: *total cost minus the gross return of culls, then divided by net yield of fresh Coral Champagne cherries*. The calculation considers the gross yield and packout, and their associated harvest and packaging costs. For instance, if the gross yield during full production is 10,000 lb/acre, the net yield is 8,000 lb/acre given an 80% packout. Given this net yield, a return of approximately $2.55/lb must be received for the Coral Champagne sweet cherry enterprise to break even.

Excel Workbook

An Excel spreadsheet version of this enterprise budget (Table 2) as well as associated data underlying the per-acre cost calculations (Tables 5 through 8 and Appendices 1 through 6 for establishment costs, full production costs, calculation of salvage value and depreciation costs, amortization calculator, all production-related data, and net present value and payback period calculators for the Coral Champagne sweet cherry orchard investment) are available at the WSU School of Economic Sciences Crop Enterprise Budgets website. The spreadsheets with updates for costs of labor, fertilizer, and propane fuel as of 2022 are also available at this website.

Owner-operators can modify select values and thus use the Excel Workbook to evaluate their own production costs and returns.

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R. Karina Gallardo, Professor and Extension Specialist, School of Economic Sciences, Puyallup Research and Extension Center, Center for Precision and Automated Agricultural Systems, Washington State University

Suzette P. Galinato, Assistant Director IMPACT Center, School of Economic Sciences, Washington State University

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