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Orchard Economics

*The Costs of Establishing a Sweet Cherry
Orchard in Wasco County*

EM 8479 • October 1991



OREGON STATE UNIVERSITY EXTENSION SERVICE

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ORCHARD ECONOMICS: THE COSTS OF ESTABLISHING A SWEET CHERRY ORCHARD IN WASCO COUNTY

Clark F. Seavert and Lynn E. Long*

INTRODUCTION

Northern Wasco County has proved itself as an ideal place to grow sweet cherries. Silt loam soils with sunshine and the general absence of rain after late-May attracted the first cherry growers to the area in the late 19th century. Since that time there have been many changes in sweet cherry production, but the climate and locale remain ideal for the production of high quality sweet cherries.

With the establishment of The Dalles Irrigation District in the early 1960's production began to increase. Slowly, many growers began to put in denser blocks of trees or interplanted in established blocks. This was one of the main factors contributing to the increase in production from an average of 12,739 tons for 1966-1970 to 27,428 tons for 1986-1990.^[1]

Oregon is second only to Washington in sweet cherry production. Wasco County has produced over 55 percent of the total 1986-1990 state average of 49,600 tons.^[2] Most of this production occurs in a small, concentrated area immediately surrounding The Dalles.

Although sweet cherries are the only crop for most Wasco County orchardists, diversification comes from selling the cherries to four different markets. From 1986-1990, 45 percent of the Wasco County cherry production was processed as

brined cherries. These are generally the cultivar 'Royal Ann'. 'Bings' make up the vast majority of the fresh market which accounts for 32 percent of the total sweet cherry crop. The remainder of the crop is split evenly between canning and freezing markets.^[1]

Due to limitations imposed by the size of the irrigation district, cherry acreage has not expanded significantly in Wasco County for many years. For most Wasco County growers establishing a new block of cherries first means removing an old, less-productive site. A large percentage of the cherry trees growing in Wasco County are more than 40 years old. This study is intended to help growers as they plan and establish new blocks of cherries.

In the next section of this study, assumptions were made by the authors and the four producers who assisted in the study. These assumptions are important in gathering, assessing and analyzing data that represents a clear and concise analysis for this study and future research.

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Following the listing of assumptions, enterprise budgets for sweet cherry establishment and production are developed to estimate economic costs and returns. The enterprise budgets include gross returns, variable costs and fixed costs. These budgets are useful in comparing the economic profitability of sweet cherries with alternative farm and non-farm investments.

A basic use of a cash flow budget is to allow a producer to plan for financing and

control over the cash position of the orchard. The cash flow section of this study examines only the cash requirements of establishing a sweet cherry orchard. In this section, cash expenses include operating expenditures for items such as fertilizer, labor, and fuel. A cash flow analysis is used strictly to examine the flow of funds in the orchard, and provides no information as to the profitability of the orchard.

ASSUMPTIONS

In this study, the authors made assumptions that provided a basis for the analysis. These assumptions include:

1. the typical orchard in Wasco County consists of 85 total productive acres. Bearing acres include: 80 acres of sweet cherries and 5 acres, or approximately 6 percent, of the orchard under establishment;
2. remove 70 existing trees per acre;
3. replant 91 trees per acre (22' x 22' spacing) consisting of 81 (89%) Bing trees and 10 Van trees (11%) for pollination;
4. hired labor is valued at \$6.50 per hour which includes withholding taxes, recordkeeping, preparing W-2 forms, etc;
5. owner operator labor is valued at \$8.50 per hour and treated as a non-cash expense. This labor is used in planting trees, replanting damaged trees, pruning and training trees, fertilizing, spraying herbicides and insecticides, irrigating, and assisting in harvest operations;
6. machinery and equipment costs are based on agricultural estimates from the American Society of Agricultural Engineers. The machinery and equipment assumptions are listed in Table 1 and the assumed cost calculations are listed in Table 2. Gasoline costs \$1.10 per gallon and diesel fuel costs \$0.90 per gallon;
7. operating capital is charged a rate of 12 percent interest and treated as a cash expense. One-fourth of the cash expenses are borrowed for a six month period;
8. intermediate and long-term capital are charged rates of 10 percent interest and treated as non-cash opportunity costs of capital;
9. farm machinery and land is owned by the operator and assessed a 10 percent rate of interest as an opportunity cost. Bare orchard land is valued at \$3,500 per acre;
10. sweet cherry price is \$.35 per pound or \$700 per ton.
11. herbicides used for strip maintenance are applied to one-third of each acre,

assuming one-third of the orchard is strips between trees. The formulations shown are for 1-acre applications; herbicide rates were multiplied by one-third to determine actual application rates per acre of orchard as shown in Table 3;

12. because of constantly changing labels, laws, and regulations, Oregon State University can assume no liability for the consequences of use of chemicals suggested in Tables 3 and 4. In all cases, read and follow the directions and precautionary statements on the specific pesticide product label. Also, mention of trade-name products does not mean any endorsement of these products by Oregon State University Extension Service, and the fact that other products are not mentioned does not mean any discrimination against them. Substitute the manufacturers formulations, as appropriate, for those included in this analysis.
13. labor facilities provided by the owner cost \$2,000 for a 5 person unit. Sixteen units are required for this size of operation. The life of the facility is 30 years and depreciated using the

straight-line method of depreciation with a zero salvage value. Interest is calculated using the average value of the facility multiplied by a 10 percent interest rate $(\text{cost} + \text{salvage value}) \div 2 \times .10$. Repair and maintenance for

- these facilities costs two and one-half percent of the purchase price per year;
14. a solid set irrigation system is used at an estimated cost of \$1,200 per acre with a salvage value of zero. Depreciation is calculated over 25 years using the straight-line method. Interest is calculated using the average value of the system multiplied by a 10 percent interest rate $(\text{cost} + \text{salvage value}) \div 2 \times .10$. Repairs are estimated at three-quarters of a percent of the purchase price per year;
15. price inflation for the time period of this study is ignored; and
16. income tax consequences are also ignored for this analysis.

Using these general assumptions, enterprise budgets were constructed for each of the first eight years of establishment and a budget for a typical full production year.

Table 1. Machinery and Equipment Assumptions for a Sweet Cherry Orchard in Wasco County.

Machine	Size	Current Market Value	Hours of Annual Use	Expected Life (yrs)
Tractor	4 Wheel Dr 60Hp	\$22,000	500.0	10.0
Tractor	2 Wheel Dr 50Hp	17,500	500.0	10.0
Truck	2 Ton, Used	10,000	100.0	10.0
Pickup	1/2 Ton, New	10,000	333.0	10.0
ATV	4 Wheeler, New	2,300	400.0	5.0
Blast (PTO) Sprayer	400 Gallon Unit	10,000	160.0	10.0
Weed Sprayer	100 Gallon Unit	2,000	85.0	15.0
Fertilizer Spreader		2,000	20.0	15.0
Flail	8' Unit	4,000	150.0	7.0
Auger		1,500	8.0	20.0
Bin Trailer	2 Units	2,500	150.0	20.0
Ladders	80 Units	8,663	N/A	20.0
Picking Equipment	1600 buckets	8,800	N/A	5.0
Chain Saw	3 Units	450	N/A	3.0
Pruning Saw	3 Units	144	N/A	2.0
Pole Pruners	3-Pole Pruner, 1-Loppers	240	N/A	5.0
Irrigation System	Solid Set Unit/Acre	1,200	N/A	25.0
Labor Facilities	16 Units	32,000	N/A	30.0

Table 2. Machinery and Equipment Cost Calculations (per hour basis)

		COSTS PER HOUR					
Machine	Size	Variable		Fixed			Total
		Fuel & Lube	Repair & Maint.	Depreciation	Interest	Housing & Insurance	
Tractor	4 Wheel Dr 60Hp	\$3.11	\$1.32	\$3.10	\$3.02	\$0.28	\$11.52
Tractor	2 Wheel Dr 50Hp	2.07	1.05	2.47	2.40	0.23	8.68
Truck	2 Ton, Used	8.43	2.30	6.22	6.86	0.65	26.45
Pickup	1/2 Ton, New	3.80	3.72	1.87	2.06	0.19	12.53
ATV	4 Wheeler, New	0.13	1.60	0.95	0.39	0.04	3.14
Blast (PTO) Sprayer	400 Gallon Unit	0.00	4.72	5.14	4.05	0.40	14.32
Weed Sprayer	100 Gallon Unit	0.00	0.24	1.57	1.18	0.12	3.10
Fertilizer Spreader		0.00	0.57	5.49	6.48	0.65	13.18
Flail	8' Unit	0.00	1.66	3.14	1.73	0.17	6.70
Auger		0.00	0.18	0.88	0.88	0.09	2.03
Bin Trailer	2 Units	0.00	0.29	1.47	1.47	0.15	3.38
COSTS PER ACRE							
Ladders	80 Units	0.00	1.02	5.10	5.50	0.00	11.21
Picking Equipment	1600 buckets	0.00	1.04	20.71	5.18	0.00	26.92
Chain Saw	3 Units	0.00	0.05	1.76	0.26	0.00	2.08
Pruning Saw	3 Units	0.00	0.02	0.85	0.08	0.00	0.95
Pole Pruners	3-Pole Pruner,1-Lopper	0.00	0.03	0.56	0.14	0.00	0.73
Irrigation System	Solid Set Unit/Acre	0.00	9.00	48.00	60.00	0.00	117.00
Labor Facilities	16 Units	0.00	9.41	12.55	18.82	0.00	40.78

Table 3. Herbicides used for Sweet Cherry Production in Wasco County, Years 3 through Full Production.

Herbicide	Quantity per Acre	\$ per Unit	Total Cost	\$ per Applied Acre
Spring Application				
Roundup	1.5 quarts	16.10	24.15	\$ 7.97
2-4,D	1.0 quart	4.13	4.13	1.36
Surfactant	1.0 pint	1.99	1.99	0.66
Fall Application				
Roundup	1.0 quart	16.10	16.10	5.31
Surflan	2.0 quarts	18.43	36.86	12.16
Goal	2.0 quarts	17.03	34.06	11.24
Surfactant	1.0 pint	1.99	1.99	0.66
Total Cost Per Acre				\$39.36

Table 4. Insecticides used for Sweet Cherry Production in Wasco County, Years 4 through Full Production.

Insecticide	Rate	\$ per Unit	Total per Acre
ULV Malathion	5.0 applications	8.95	\$44.75
Superior Oil	3.0 gallons	3.15	9.45
Parathion 8E	1.0 pint	4.91	4.91
Parathion 25wp	4.0 pounds	2.53	10.12
Total Cost Per Acre			\$69.23

Enterprise Budgets

Enterprise budgets are used to show the gross returns, variable costs and fixed costs associated with producing or establishing a particular crop. This section of the study reports the gross returns, variable costs, and fixed costs for the establishment period and a typical full production year for sweet cherries in Wasco County. The establishment period is 8 years long. Each enterprise budget is for a calendar year, and all budgets are prepared as of the end of their respective years. Refer to Appendix A, page 15, for detailed listings of the enterprise budgets.

Year 0

Before planting new sweet cherry trees, the site must be prepared. Year 0, Table 7, page 16, is referred to as the year the old trees are removed. The operator custom hires the removal of trees and roots, filling in holes and ripping the soil. Custom tillage and lime application prepare the soil for the next year's trees. The operator rents a disc at a cost of \$4 per acre, for each operation, and discs the soil with the 60 Hp tractor four times (5 hours total) for proper soil preparation. Vapam is applied to fumigate the soil. Twenty hours of labor is used to apply this fumigant and one-half

of this labor is hired. After fumigation, 3.03 hours of hired labor is used to cover the holes. A solid set irrigation system is installed at a cost of \$1,200 per acre. Total variable cost is \$1,057 per acre. The remaining costs are fixed, including cash and non-cash items. Fixed cash items include insurance on machinery and equipment, pickups, trucks, ATV's and property and property taxes. Fixed cash cost is \$107 per acre and fixed non-cash cost is \$672 per acre. Fixed non-cash costs include a land interest charge and depreciation and interest on machinery and equipment, pickups, trucks, ATV's, irrigation system, and labor facilities. Total fixed cost is \$779 per acre. The total establishment cost in Year 0 is \$1,836 per acre.

Year 1

Year 1 is shown in Table 8, page 18. Young trees are planted in a 22' x 22' spacing (91 trees per acre) and require 3.03 hours of labor per acre to plant. One-half of this labor is hired. Tree cost is \$5.50 per tree and planted with the use of a tractor & auger at a variable cost of \$0.27 per tree (\$24.94 per acre ÷ 91 trees), including labor. Total variable cost to plant trees is \$5.77 per tree (\$5.50 per tree + \$.27 per tree labor and variable machinery costs). Training and pruning trees is \$34.45 per acre. At the time of planting the tree is topped as a pruning practice. This procedure requires 4.55 hours of labor per acre and one-half of this labor is hired. Also, trees are trained using toothpicks as spreaders for limb control. This procedure requires 3.03 hours of hired labor per acre. Tree wraps are installed at a cost of \$.15 per tree including 1.25 hours of hired labor to install the wraps. Hired labor also hand hoes around the trees at a cost of \$19.70 (3.03 hours x \$6.50 per hour) per acre.

In this year, the orchard is strip sprayed with a spring application of Gramoxone,

2,4-D with a surfactant and a fall application of Gramoxone, Surflan with a surfactant. The orchard is mowed three times by the owner using the flail mower, (one hour for each mowing) between the rows to control weeds. Companion grass is seeded as a cover crop to assist in controlling weeds. Rodent control is hand applied at a variable cost of \$12.05 per acre (1.50 hours of hired labor and \$2.30 materials per acre). The orchard is irrigated, in 12 hour sets, 12 times during the year for a total of 144 hours. The owner provides 4.0 hours of labor per acre per year for irrigation. A variable cost of \$2.15 per acre is charged to repair broken or damaged picking and pruning equipment and ladders.

Total variable cost is \$875. Fixed cash cost is \$104 per acre and fixed non-cash cost is \$1,004 per acre. Owner labor is \$104.55 per acre for 12.3 hours of work. This is a non-cash item but must be included in the study to account for all economic costs. Interest on accumulative investment is an opportunity charge from the total cost in the prior year. To calculate this cost, multiply the prior year's cumulative costs (Year 0 is \$1,836 per acre) by 10 percent interest for an opportunity cost of \$183.60 per acre. Total cost in establishment Year 1 is \$1,984 per acre. Cumulative Year 0 and 1 establishment cost is \$3,820 per acre.

Year 2

Year 2, Table 9, page 20, is the first year after the trees are planted. Tree training and pruning requires 1.50 hours of owner labor per acre. One dead tree is removed and replanted with the same variety. This procedure requires 15 minutes of labor to remove the tree and 15 minutes of labor and machine time to replant the tree. The cost to replant the new tree is \$5.56 (\$5.50 per tree + \$.06 per wrap). This tree replacement is due to damaging

climatic factors, rodents and diseases. Calcium nitrate is hand applied at a rate of 110 pounds per acre.

The variable cost is \$269 per acre, fixed cash cost is \$100 per acre and fixed non-cash cost is \$1,097 per acre. The total cost for establishment Year 2 is \$1,465. Cumulative Year 0, 1 and 2 establishment cost is \$5,285 per acre.

Year 3

In establishment Year 3, Table 10, page 22, training and pruning increases to three hours of owner labor per acre. Tree trunks are painted, requiring two hours of labor per acre with the owner providing one-half the labor. Paint and materials are \$9.50 per acre.

The fertilizer rate increases to 160 pounds per acre. Herbicide applications are alternated to a spring application of Roundup, 2,4-D with a surfactant and a fall application of Roundup, Surflan, Goal with a surfactant for a more effective weed control.

Total variable cost is \$312 per acre, total fixed cost is \$1,352 per acre; fixed cash cost is \$100 per acre and fixed non-cash cost is \$1,252 per acre. Total cost is \$1,664 per acre. Cumulative establishment cost including Year 3 is \$6,949 per acre.

Year 4

In establishment Year 4, Table 11, page 24, the orchard will begin producing sweet cherries. We assume 1,000 pounds of sweet cherries are harvested at an average price of \$.35 per pound or \$700 per ton. Projected gross returns are \$350 per acre.

Training and pruning requires six hours of owner labor per acre. Ammonium nitrate is broadcast applied, replacing calcium nitrate, at a rate of 200 pounds per acre. When applying insecticides, 5.0 pounds of Solubor and 1.2 pounds of Zinc-50 is also foliar applied for a total cost of \$24.63 per acre for materials. Also in Year

4, 5.0 applications of ULV Malathion, 3.0 gallons of Superior Oil, 1.0 pint of Parathion 8E and 4.0 pounds of Parathion 25wp are applied. Mowing is increased to five times per year. One hour of labor and machine time is required for each operation. One-half of this labor is hired.

Variable harvest cost is \$130 per acre. This cost includes \$2.15 per bucket for the picking crew, (\$1.65 per 20# bucket plus 30 percent for worker's compensation, payroll taxes, etc.) and 1.8 hours of general labor per acre for yarding and supervising, hauling, and cleanup at \$7.00 per hour. The 60 and 50 Hp tractors are used with the bin trailers to load and transport bins from the field, requiring approximately one-half hour per acre. A forklift is rented at a cost of \$30 per hour to load bins onto trucks for approximately 15 minutes per acre. Oregon Sweet Cherry Commission and Wasco County Fruit and Produce League Assessments are \$19.50 per ton for a cost of \$9.75 per acre.

Total variable cost is \$530 per acre. Fixed cash cost is \$102 per acre and fixed non-cash cost is \$1,483 per acre. Total fixed cost is \$1,585 per acre. Total cost in establishment Year 4 is \$2,115 per acre. Net projected income in Year 4 is -\$1,765 per acre. Cumulative establishment cost including Year 4 is \$8,714 per acre.

Year 5

In Year 5, Table 12, page 26, 2,000 pounds of sweet cherries are harvested at a price of \$.35 per pound. Projected gross income is \$700 per acre.

One-half the training and pruning labor is now hired at a cost of \$34.13 per acre (10.5 total hours) and considered a cash item. Tree trunks are again painted requiring two hours of hired labor and \$11.25 for paint and materials. One tree per acre is again removed and replace; however, trees at this age will require a backhoe to remove the damaged tree.

Also, when the tree is replaced a can of fumigant is applied at an additional cost of \$1.50 per tree.

After pruning, the orchard floor is raked and shredded requiring one hour of hired labor and machine time at a total variable cost of \$12.59 per acre. Mildew control is performed using a Rovral 50wp and dry flowable sulfur. One Dry Flowable Sulfur is applied with the Parathion 8E application. A Pro-Gibb 4% application is applied as a growth regulator. One bee hive per acre is used for pollination to increase yields.

Total variable cost is \$857 per acre, total fixed cash cost is \$103 per acre and total fixed non-cash cost is \$1,684 per acre. Total cost in establishment Year 5 is \$2,644 per acre with a net projected return of -\$1,944 per acre. Cumulative establishment cost including Year 5 is \$10,658 per acre.

Year 6

In Year 6, Table 13, page 28, 4,000 pounds of sweet cherries are harvested at a price of \$.35 per pound. Total gross income is \$1,400 per acre.

Training and pruning labor increases to 12 hours per acre. The owner provides one-half of the labor. Year 6 costs are very similar to Year 5 with the exception of increased harvesting costs due to the increase in yield.

Total variable cost is \$1,121 per acre, fixed cash cost is \$104 per acre and fixed non-cash cost is \$1,897. Total cost of establishment in Year 6 is \$3,121 per acre. The projected net return is -\$1,721 per acre. Notice in this year the gross income is sufficient to cover total variable costs but not the total economic cost of establishment in this year. Cumulative establishment cost including Year 6 is \$12,379 per acre.

Year 7

In Year 7, Table 14, page 30, 6,000 pounds of sweet cherries are harvested at a price of \$.35 per pound. The projected gross return is \$2,100 per acre.

Training and pruning labor increases to 15 hours per acre. The owner now provides one-third of the labor. In Year 7, some tree limbs are too large to rake or shred. One-half an hour of hired labor is required to remove these large limbs before the rake and shredding operations can be performed. Pro-Gibb 4% is increased to 1.5 pints per acre as a growth regulator.

Total variable cost is \$1,467 per acre. Fixed cash cost is \$104 per acre and fixed non-cash cost is \$2,072 per acre. Total fixed cost is \$2,177 for a total cost in establishment Year 7 of \$3,643. Projected net returns are -\$1,543 per acre. Cumulative establishment cost including Year 7 is \$13,922 per acre.

Year 8

We estimate Year 8, Table 15, page 32, to be the last year in establishing an acre of sweet cherries in Wasco County. Projected gross returns are \$3,500 per acre based on harvesting 10,000 pounds of sweet cherries at \$.35 per pound.

Training and pruning labor increases to 18 total hours with the owner providing one-third of the labor. Ammonium nitrate increases to 250 pounds per acre, broadcast applied, at a cost of \$37.33 per acre, for materials only. An additional one-half bee hive per acre is added to increase pollination for potentially higher yields. Ten pounds of Copper is applied for additional disease control at a cost of \$22 per acre for the material.

Total variable cost is \$2,063 per acre and total fixed cost is \$2,370 per acre; fixed cash cost is \$106 per acre and fixed non-cash cost is \$2,264 per acre. Total establishment cost in Year 8 is \$4,433 per acre. Projected net returns are -\$933 per

acre. Total cumulative establishment cost including Year 8 is \$14,855 per acre. This amount is amortized over 35 years, the estimated life of the orchard after establishment.

Production Years

Table 16, page 34, shows an enterprise budget of an acre of sweet cherries in Wasco County at full production. Long-term yields are estimated to be 16,000 pounds. Projected gross returns are \$5,600 per acre.

Training and pruning labor requires 20 total hours of labor per acre with the owner providing one-third of the labor. Hired labor to remove limbs before raking and shredding is increased to one hour per acre. Ammonium nitrate is increased to 330 pounds per acre, broadcast applied. Two bee hives per acre are used for increased pollination.

Total establishment cost is \$14,855 per acre and amortized at ten percent interest over a 35 year life, for a cost of \$1,540 per

acre per year. This charge represents the annual payment, or opportunity cost, required to repay a loan taken out to establish an acre of sweet cherries.^[3] Alternatively, it can represent the income you could earn over the next 35 years if you make an investment of \$14,855 which earns a 10 percent return.

Total variable cost is \$2,908 per acre. Projected net returns over variable cost is \$2,692 per acre. Total fixed cost is \$2,546; fixed cash cost is \$106 per acre and fixed non-cash is \$2,440 per acre. Total long-term costs to produce 16,000 pounds of sweet cherries is \$5,454 per acre per year. This enterprise budget projects a \$146 per acre return over total costs to a producer using this type of orchard establishment technique.

Using the projected prices, the break-even yield to cover total variable cost is approximately 8,308 pounds per acre and 15,584 pounds per acre to cover total cost. Break-even price for this type of orchard is \$.18 per pound for variable cost and \$.34 per pound for total cost.

CASH FLOW ANALYSIS

The enterprise budgets presented in this study illustrate the economic costs and returns of establishing an acre of sweet cherries. These costs included cash costs as well as non-cash costs. The cost of fixed assets were spread over their useful lives in the form of depreciation and interest.^[3] A cash flow analysis is similar; however, it does not include depreciation, opportunity costs, owner labor and a return to land. This cash flow analysis projects only the cash requirements to establish an acre of sweet cherry orchard, assuming the land, machinery, equipment and labor facilities are owned and paid for.

Table 5, page 11, projects gross returns are greater than the establishment cash costs incurred beginning in Year 6. By Year 10, the producer will receive sufficient gross returns to repay all cash costs. However, it must be stressed, this is not the break-even year of establishment. This is only the year in which cumulative gross returns are greater than cash costs without any regard to opportunity costs, interest charges, depreciation, owner labor and a return to land. Over the long-run, depreciable assets must be replaced and fixed factors of production must be paid for.

SUMMARY AND CONCLUSIONS

Financial institutions are concerned about the cash flow capabilities of the orchard industry. Lenders require financial documents that demonstrate the cash flow repayment schedule of the farm business. Obsolete and depreciated orchards do not meet cash flow requirements of a farm business and need to be replaced for a positive economic return. Many producers and lenders need assistance in calculating these costs of establishment for a better financial analysis.

The cash flow analysis probably shows the most important information to a producer and lender. This analysis shows the flow of funds required to establish an acre of sweet cherries and the capability of the producer to repay these funds.

Table 5, page 11, shows the cash costs and returns associated with establishing an acre of sweet cherries for the first ten years. As shown in this table, Year 6 is the year gross income is greater than cash costs. Year 10 is when the gross incomes are large enough to pay all accumulated cash costs. In other words, the producer should be able to begin repaying all cash costs to a financial institution. Consequently, this cash flow analysis will assist producers and lenders in their management decision to establish a sweet cherry orchard in Wasco County.

Figure 1, page 13, summarizes the variable costs in Table 5. This figure shows hired labor is \$3,479 per acre or approximately 41 percent of total variable cost. Machine costs are \$1,093, or 13 percent, chemicals cost \$955, or 11 percent, custom applications cost \$641, or

7 1/2 percent, trees and staking \$548, or 6 1/2 percent and other costs are \$1,835 per acre, or approximately 21 percent of total variable cost.

Table 6, page 12, is a summary of the economic costs to establish an acre of Sweet Cherries in Wasco County. This table shows the variable costs, fixed costs, total costs, gross incomes, net cost and cumulative costs from the enterprise budgets, year 0 through year 8. Total variable cost for the establishment period is \$8,551 per acre. Total fixed cost is \$14,354 per acre. Total variable and fixed costs are \$22,905. The cumulative costs are a summation of the net costs for all establishment years. The total cumulative cost to establish an acre of sweet cherries is \$14,855.

Figure 2, page 13, summarizes the total cumulative fixed and variable costs of Table 6. Interest costs are \$9,677 per acre, or approximately 42 percent of the total cost in establishing sweet cherries. Hired and owner labor is \$4,470, or 20 percent, machine costs are \$3,736, or 16 percent, and the remaining costs are \$5,022 per acre, or approximately 22 percent of the total cost component. These figures show graphically the major cost components in establishing an acre of sweet cherries in Wasco County.

At full production, the break-even yield is 8,308 pounds per acre to cover variable costs and 15,584 pounds per acre to cover total costs. Break-even prices, at the assumed 16,000 pounds per acre yield, to cover variable cost is \$.18 per pound and \$.34 per pound to cover total costs.

Table 5. Sweet Cherry Establishment Cash Flow Analysis, 1 Acre ¹

Item	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Gross Income					350	700	1,400	2,100	3,500	5,600	5,600
Variable Costs	1,117	988	299	331	584	945	1,237	1,618	2,277	3,184	3,184
Fixed Cash Costs	1,307	104	100	100	102	103	104	104	106	106	106
Annual Cash Flow	-2,424	-1,092	-399	-431	-336	-348	59	378	1,117	2,310	2,310
Cumulative Cash Flow	-2,424	-3,516	-3,915	-4,346	-4,682	-5,030	-4,971	-4,593	-3,476	-1,166	1,144

¹ The cash flow variable costs are not identical to the total variable costs shown in the Economic Costs and Returns Budgets. This is due to the interest charge assessed on all cash costs for a 12 month period rather than one-fourth of the cash expenses borrowed for a 6 month period assumed in the Economic Costs and Return Budgets. Also in Year 0, the cash flow is higher, then in Year 0's Economic Cost and Return Budget, because it reflects the purchase of the irrigation system. The Economic Costs and Return Budget depreciates the irrigation system over a 25 year period.

Table 6. Economic Costs of Establishing a Sweet Cherry Orchard in Wasco County.

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Totals
	Dollars Per Acre									
Variable Costs:										
Custom Applications	565.50	0.00	0.00	0.00	0.00	12.50	12.50	25.00	25.00	640.50
Trees and Staking	2.73	500.50	5.56	5.56	5.56	7.06	7.06	7.06	7.06	548.15
Tree Wraps & Painting	0.00	5.46	0.00	9.50	0.00	11.25	0.00	0.00	0.00	26.21
Seeded Cover Crop	16.50	22.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	39.00
Fertilizer	0.00	2.73	12.38	18.00	24.63	24.63	24.63	32.45	37.33	176.78
Chemicals	0.00	28.11	28.11	39.36	108.59	174.19	174.19	190.44	212.44	955.43
Bee Hives	0.00	0.00	0.00	0.00	0.00	22.00	22.00	22.00	33.00	99.00
Rodent Materials	0.00	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	18.40
Hired Labor (including harvest)	154.77	83.79	19.51	35.76	150.99	327.19	558.42	828.83	1,319.63	3,478.89
Water Assessments	59.00	59.00	59.00	59.00	59.00	59.00	59.00	59.00	59.00	531.00
Commission Assessments	0.00	0.00	0.00	0.00	9.75	19.50	39.00	58.50	97.50	224.25
Labor Facilities	9.41	9.41	9.41	9.41	9.41	9.41	9.41	9.41	9.41	84.69
Machine Costs	124.50	98.65	78.65	78.65	101.49	125.04	145.84	159.86	180.19	1,092.87
Miscellaneous	65.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	50.00	465.00
Interest, Operating Capital	59.84	12.94	3.97	4.61	7.83	12.66	16.57	21.67	30.49	170.58
Total Variable Cost	1,057.25	875.39	268.89	312.15	529.55	856.73	1,120.92	1,466.52	2,063.35	8,550.75
Fixed Costs:										
Insurance	62.29	59.46	55.23	55.23	56.89	58.19	58.99	59.38	60.72	526.38
Property Taxes	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	45.00	405.00
Machine Costs	147.56	334.44	256.22	256.22	291.58	319.29	332.50	339.92	365.86	2,643.59
Labor Facilities	31.37	31.37	31.37	31.37	31.37	31.37	31.37	31.37	31.37	282.33
Owner Labor	142.63	104.55	76.67	85.34	115.35	111.52	116.88	113.05	124.95	990.94
Land Cost	350.00	350.00	350.00	350.00	350.00	350.00	350.00	350.00	350.00	3,150.00
Int. on Estab. Costs	0.00	183.60	382.00	528.50	694.90	871.40	1,065.80	1,237.90	1,392.20	6,356.30
Total Fixed Cost	778.85	1,108.42	1,196.49	1,351.66	1,585.09	1,786.77	2,000.54	2,176.62	2,370.10	14,354.54
Total Cost	1,836.10	1,983.81	1,465.38	1,663.81	2,114.64	2,643.50	3,121.46	3,643.14	4,433.45	22,905.29
Gross Income	0.00	0.00	0.00	0.00	350.00	700.00	1,400.00	2,100.00	3,500.00	8,050.00
Net Cost	1,836.10	1,983.81	1,465.38	1,663.81	1,764.64	1,943.50	1,721.46	1,543.14	933.45	14,855.29
Cumulative Cost	1,836.10	3,819.91	5,285.29	6,949.10	8,713.74	10,657.24	12,378.70	13,921.84	14,855.29	

FIGURE 1. ACCUMULATIVE VARIABLE COSTS

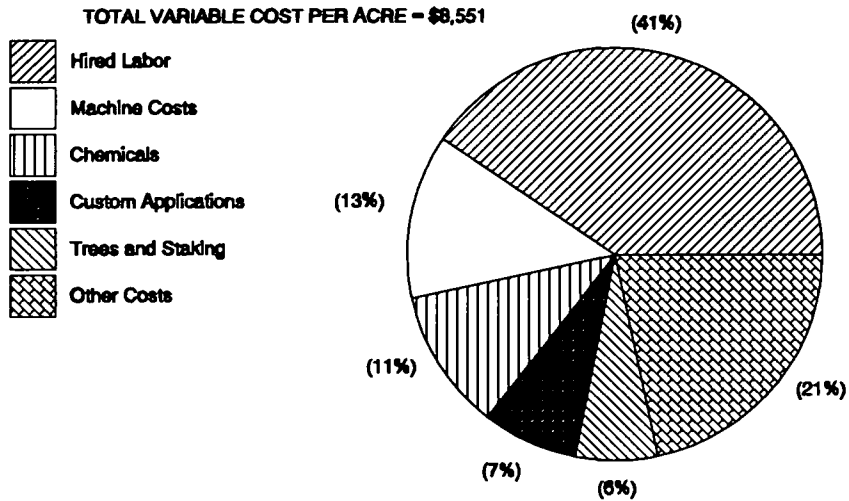
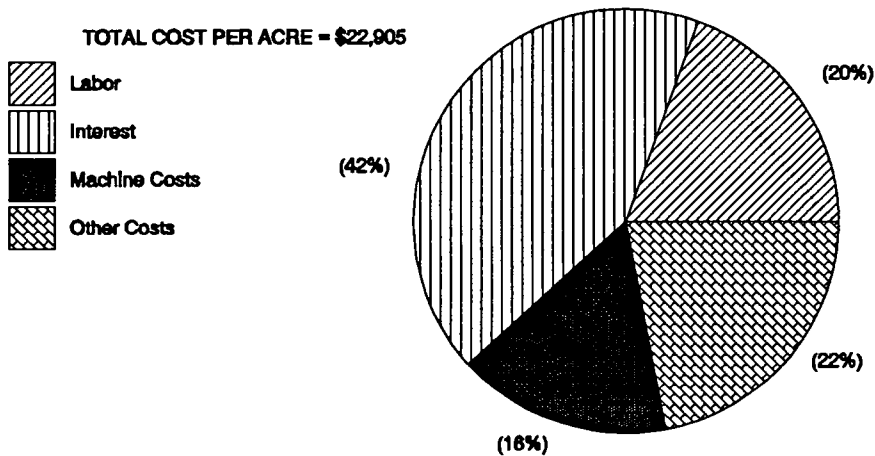


FIGURE 2. TOTAL ACCUMULATIVE FIXED AND VARIABLE COSTS



REFERENCES

1. *Estimated Production and Value of Sweet Cherries for Wasco County, 1986-1990.* Copies can be obtained at no charge from the Wasco County Extension Office, 400 E. 5th, Courthouse Annex A. The Dalles, OR 97058.
2. *Statistical Compilation of Production, Utilization, Average Prices and Imports of Sweet Cherries, 1988 and 1990 Report.* Copies can be obtained at no charge from National Cherry Growers & Industries Foundation, Inc., 1105 N.W. 31st St., Corvallis, OR. 97333.
3. Cross, Tim; Ted Casteel, *Vineyard Economics: The Costs Of Establishing and Producing Wine Grapes in the Willamette Valley*, Extension Miscellaneous 8407, Extension Service, Oregon State University, September, 1989. Single copy \$2.50 plus \$.38 shipping and handling; order from Publication Orders, Agricultural Communications, OSU Admin. Services 422, Corvallis, OR 97331-2119.

APPENDIX A

Table 7. Sweet Cherries, Establishment Year 0, \$/Acre Economic Costs and Returns.

<u>VARIABLE COSTS</u>	<u>Description</u>	<u>Labor</u>	<u>Machinery</u>	<u>Materials</u>	<u>Total</u>
LAND PREPARATION					
Remove trees, roots and fill holes, Custom		0.00	0.00	250.00	250.00
Rip, Custom	0.5 hours x 50.00=25.00	0.00	0.00	25.00	25.00
Disc (4x)		32.50	41.60	0.00	74.10
Staking	91 stakes x .03=2.73	22.75	0.00	2.73	25.48
Dig holes		14.82	17.11	0.00	31.93
Soil Sample		0.00	0.00	15.00	15.00
Lime application, Custom		0.00	0.00	154.00	154.00
Ag Lime	2 ton x 77.00=154.00				
Fumigation		84.70	0.00	136.50	221.20
Vapam	91 holes x 1.50=136.50				
Planting cover crop		0.00	6.58	16.50	23.08
Ryegrass	10 pounds x 1.65=16.50				
Total LAND PREPARATION					819.78
Pickups; Trucks & ATV's		0.00	50.21	0.00	50.21
Labor Facilities - Repairs & Maintenance		0.00	0.00	9.41	9.41
Irrigation and Water Assessment		0.00	9.00	59.00	68.00
Miscellaneous		0.00	0.00	50.00	50.00
Interest: Operating Capital		0.00	0.00	59.84	59.84
Total VARIABLE COST		154.77	124.50	777.98	1,057.25

Table 7. Sweet Cherries, Establishment Year 0, \$/Acre Economic Costs and Returns (continued).

<u>FIXED COSTS</u>	<u>Description</u>	<u>Units</u>	<u>Total</u>
CASH Cost			
	Machinery and Equipment Insurance	acre	8.95
	Pickups, Trucks, & ATV's Insurance	acre	3.34
	Property Insurance, etc.	acre	50.00
	Property Taxes	acre	45.00
Total CASH COST			107.29
NON-CASH Cost			
	Machinery & Equipment Depreciation, Interest & Housing	acre	70.40
	Pickups, Trucks, & ATV's Depreciation & Interest	acre	77.16
	Labor Facilities Depreciation & Interest	acre	31.37
	Owner Labor	acre	142.63
	Land Interest Charge	acre	350.00
Total NON-CASH Cost			671.56
Total FIXED Cost			778.85
Total of All Cost			1,836.10

Table 8. Sweet Cherries, Establishment Year 1, \$/Acre Economic Costs and Returns.

<u>VARIABLE COSTS</u>	<u>Description</u>	<u>Labor</u>	<u>Machinery</u>	<u>Materials</u>	<u>Total</u>
Planting Trees		9.81	15.13	500.50	525.44
	91 trees x 5.50=500.50				
Training and Pruning		34.45	0.00	0.00	34.45
Tree Wraps		8.13	0.00	5.46	13.59
	91 wraps x .06=5.46				
Hand Hoe		19.70	0.00	0.00	19.70
Fertilizer - Hand Applied		1.95	0.00	2.73	4.68
11 - 52 - 0	22.75 pounds x .12=2.73				
Herbicide - Strip Maintenance (.33x)		0.00	1.69	28.11	29.80
Spring Application					
Gramoxone	2.0 quarts x 10.05=20.10				
2-4,D	1.0 quart x 4.13=4.13				
Surfactant	1.0 pint x 1.99=1.99				
Fall Application					
Gramoxone	2.0 quarts x 10.05=20.10				
Surflan	2.0 quarts x 18.43=36.86				
Surfactant	1.0 pint x 1.99=1.99				
Seed Cover Crop		0.00	6.12	22.50	28.62
Companion	15 pounds x 1.50=22.50				
Mowing (3x)		0.00	14.35	0.00	14.35
Rodent Control		9.75	0.00	2.30	12.05
Irrigation & Water Assessment		0.00	9.00	59.00	68.00
Ladders, Pruning & Picking Equipment		0.00	2.15	0.00	2.15
Pickups, Trucks & ATV's		0.00	50.21	0.00	50.21
Labor Facilities - Repairs & Maintenance		0.00	0.00	9.41	9.41
Miscellaneous		0.00	0.00	50.00	50.00
Interest: Operating Capital		0.00	0.00	12.94	12.94
Total VARIABLE COSTS		83.79	98.65	692.95	875.39

Table 8. Sweet Cherries, Establishment Year 1, \$/Acre Economic Costs and Returns (continued).

<u>FIXED COSTS</u>	<u>Description</u>	<u>Units</u>	<u>Total</u>
CASH Costs			
	Machinery and Equipment Insurance	acre	5.98
	Pickups, Trucks & ATV's Insurance	acre	3.48
	Property Insurance, etc.	acre	50.00
	Property Taxes	acre	45.00
Total CASH Costs			104.46
NON-CASH Costs			
	Machinery and Equipment Depreciation, Interest & Housing	acre	261.44
	Pickups, Trucks & ATV's Depreciation, Interest & Housing	acre	73.00
	Labor Facilities Depreciation & Interest	acre	31.37
	Owner Labor	acre	104.55
	Land Interest Charge	acre	350.00
	Interest on Accumulative Investment	acre	183.60
Total NON-CASH Costs			1,003.96
Total FIXED COSTS			1,108.42
Total of All Costs Per Acre			1,983.81

Table 9. Sweet Cherries, Establishment Year 2, \$/Acre Economic Costs and Returns.

<u>VARIABLE COSTS</u>	<u>Description</u>	<u>Labor</u>	<u>Machinery</u>	<u>Materials</u>	<u>Total</u>
Tree Removal (1 tree)		1.63	0.00	0.00	1.63
Tree Replacement (1 tree)		1.63	1.25	5.56	8.44
Fertilizer - Hand Applied		6.50	0.00	12.38	18.88
Calcium Nitrate	110 pounds x .1125=12.38				
Herbicide - Strip Maintenance (.33x)		0.00	1.69	28.11	29.80
Spring Application					
Gramoxone	2.0 quarts x 10.05=20.10				
2-4,D	1.0 quart x 4.13=4.13				
Surfactant	1.0 pint x 1.99=1.99				
Fall Application					
Gramoxone	2.0 quarts x 10.05=20.10				
Surflan	2.0 quarts x 18.43=36.86				
Surfactant	1.0 pint x 1.99=1.99				
Mowing (3x)		0.00	14.35	0.00	14.35
Rodent Control		9.75	0.00	2.30	12.05
Irrigation & Water Assessment		0.00	9.00	59.00	68.00
Ladders, Pruning & Picking Equipment		0.00	2.15	0.00	2.15
Pickups, Trucks & ATV's		0.00	50.21	0.00	50.21
Labor Facilities - Repairs & Maintenance		0.00	0.00	9.41	9.41
Miscellaneous		0.00	0.00	50.00	50.00
Interest: Operating Capital		0.00	0.00	3.97	3.97
Total VARIABLE COSTS		19.51	78.65	170.73	268.89

Table 9. Sweet Cherries, Establishment Year 2, \$/Acre Economic Costs and Returns (continued).

<u>FIXED COSTS</u>	<u>Description</u>	<u>Units</u>	<u>Total</u>
CASH Costs			
	Machinery and Equipment Insurance	acre	1.75
	Pickups, Trucks & ATV's Insurance	acre	3.48
	Property Insurance, etc.	acre	50.00
	Property Taxes	acre	45.00
Total CASH Costs			100.23
NON-CASH Costs			
	Machinery and Equipment Depreciation, Interest & Housing	acre	183.22
	Pickups, Trucks & ATV's Depreciation, Interest & Housing	acre	73.00
	Labor Facilities Depreciation & Interest	acre	31.37
	Owner Labor	acre	76.67
	Land Interest Charge	acre	350.00
	Interest on Accumulative Investment	acre	382.00
Total NON-CASH Costs			1,096.26
Total FIXED COSTS			1,196.49
Total of All Costs Per Acre			1,465.38

Table 10. Sweet Cherries, Establishment Year 3, \$/Acre Economic Costs and Returns.

<u>VARIABLE COSTS</u>	<u>Description</u>	<u>Labor</u>	<u>Machinery</u>	<u>Materials</u>	<u>Total</u>
Tree Painting		6.50	0.00	9.50	16.00
Tree Removal (1 tree)		1.63	0.00	0.00	1.63
Tree Replacement (1 tree)		1.63	1.25	5.56	8.44
Fertilizer - Hand Applied		6.50	0.00	18.00	24.50
Calcium Nitrate	160 pounds x .1125=18.00				
Herbicide - Strip Maintenance (.33x) ¹		0.00	1.69	39.36	41.05
Mowing (3x)		9.75	14.35	0.00	24.10
Rodent Control		9.75	50.00	2.30	12.05
Irrigation & Water Assessment		0.00	9.00	59.00	68.00
Ladders, Pruning & Picking Equipment		0.00	2.15	0.00	2.15
Pickups, Trucks & ATV's		0.00	50.21	0.00	50.21
Labor Facilities - Repairs & Maintenance		0.00	0.00	9.41	9.41
Miscellaneous		0.00	0.00	50.00	50.00
Interest: Operating Capital		0.00	0.00	4.61	4.61
Total VARIABLE COSTS		35.76	78.65	197.74	312.15

¹ Refer to Table 3 for quantities per acre, cost per unit, cost per acre and cost per applied acre.

Table 10. Sweet Cherries, Establishment Year 3, \$/Acre Economic Costs and Returns (continued).

<u>FIXED COSTS</u>	<u>Description</u>	<u>Units</u>	<u>Total</u>
CASH Costs			
	Machinery and Equipment Insurance	acre	1.75
	Pickups, Trucks & ATV's Insurance	acre	3.48
	Property Insurance, etc.	acre	50.00
	Property Taxes	acre	45.00
Total CASH Costs			100.23
NON-CASH Costs			
	Machinery and Equipment Depreciation, Interest & Housing	acre	183.22
	Pickups, Trucks & ATV's Depreciation, Interest & Housing	acre	73.00
	Labor Facilities Depreciation & Interest	acre	31.37
	Owner Labor	acre	85.34
	Land Interest Charge	acre	350.00
	Interest on Accumulative Investment	acre	528.50
Total NON-CASH Costs			1,251.43
Total FIXED COSTS			1,351.66
Total of All Costs Per Acre			1,663.81

Table 11. Sweet Cherries, Establishment Year 4, \$/Acre Economic Costs and Returns.

<u>GROSS INCOME</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>\$/Unit</u>	<u>Total</u>
Sweet Cherries		1,000	pounds	0.35	350.00
Total GROSS Income					350.00
<u>VARIABLE COSTS</u>	<u>Description</u>	<u>Labor</u>	<u>Machinery</u>	<u>Materials</u>	<u>Total</u>
Tree Removal (1 tree)		1.63	0.00	0.00	1.63
Tree Replacement (1 tree)		1.63	1.25	5.56	8.44
Fertilizer - Broadcast Applied		0.00	1.85	19.50	21.35
Ammon. Nit.	200 pounds x .0975=19.50				
Fertilizer - Foliar Applied		0.00	0.00	5.13	5.13
Solubor	5.0 pounds x .75=3.75				
Zinc-50	1.2 pounds x 1.15=1.38				
Herbicide - Strip Maintenance (.33x) ¹		0.00	1.69	39.36	41.05
Insecticides ²		1.63	1.56	69.23	72.42
Mowing (5x)		16.25	23.92	0.00	40.17
Rodent Control		9.75	0.00	2.30	12.05
Irrigation & Water Assessment		0.00	9.00	59.00	68.00
Ladders, Pruning & Picking Equipment		0.00	2.15	0.00	2.15
Harvest		120.10	2.36	7.50	129.96
Picking	50 buckets x 2.15=107.50				
General Labor	1.8 hours x 7.00=12.60				
Forklift	.25 hours x 30.00=7.50				
Commission Assessments		0.00	0.00	9.75	9.75
Pickups, Trucks & ATV's		0.00	50.21	0.00	50.21
Labor Facilities - Repairs & Maintenance		0.00	0.00	9.41	9.41
Miscellaneous		0.00	0.00	50.00	50.00
Interest: Operating Capital		0.00	0.00	7.83	7.83
Total VARIABLE COSTS		150.99	93.99	284.57	529.55
GROSS INCOME minus VARIABLE COSTS					-179.55

¹ Refer to Table 3 for quantities per acre, cost per unit, cost per acre and cost per applied acre.² Refer to Table 4 for quantities per acre, cost per unit, and cost per acre.

Table 11. Sweet Cherries, Establishment Year 4, \$/Acre Economic Costs and Returns (continued).

<u>FIXED COSTS</u>	<u>Description</u>	<u>Units</u>	<u>Total</u>
CASH Costs			
	Machinery and Equipment Insurance	acre	3.41
	Pickups, Trucks & ATV's Insurance	acre	3.48
	Property Insurance, etc.	acre	50.00
	Property Taxes	acre	45.00
Total CASH Costs			101.89
NON-CASH Costs			
	Machinery and Equipment Depreciation, Interest & Housing	acre	218.58
	Pickups, Trucks & ATV's Depreciation, Interest & Housing	acre	73.00
	Labor Facilities Depreciation & Interest	acre	31.37
	Owner Labor	acre	115.35
	Land Interest Charge	acre	350.00
	Interest on Accumulative Investment	acre	694.90
Total NON-CASH Costs			1,483.20
Total FIXED COSTS			1,585.09
Total of All Costs Per Acre			2,114.64
NET PROJECTED RETURNS			-1,764.64

Table 12. Sweet Cherries, Establishment Year 5, \$/Acre Economic Costs and Returns.

<u>GROSS INCOME</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>\$/Unit</u>	<u>Total</u>
Sweet Cherries		2,000	pounds	0.35	700.00
Total GROSS Income					700.00
<u>VARIABLE COSTS</u>	<u>Description</u>	<u>Labor</u>	<u>Machinery</u>	<u>Materials</u>	<u>Total</u>
Train and Prune		34.13	0.00	0.00	34.13
Tree Painting		13.00	0.00	11.25	24.25
Tree Removal (1 tree)		1.63	0.00	12.50	14.13
Tree Replacement (1 tree)		1.63	1.25	7.06	9.94
Raking and Shredding Brush		6.50	6.09	0.00	12.59
Fertilizer - Broadcast Applied		0.00	1.85	19.50	21.35
Ammonium Nitrate 200 pounds x .0975=19.50					
Fertilizer - Foliar Applied		0.00	0.00	5.13	5.13
Solubor 5.0 pounds x .75=3.75					
Zinc-50 1.2 pounds x 1.15=1.38					
Herbicide - Strip Maintenance (.33x) ¹		0.00	1.69	39.36	41.05
Disease Control		2.47	6.86	33.10	42.43
Rovral 50wp 1.0 pound x 24.10=24.10					
D. Flow. Sulfur 10.0 pounds x .90=9.00 (2x)					
Insecticides ²		1.63	2.29	69.23	73.15
Growth Regulator		0.00	0.00	32.50	32.50
Pro-Gibb 4% 1.0 pint x 32.50=32.50					
Mowing (5x)		16.25	23.92	0.00	40.17
Hive Rental		0.00	0.00	22.00	22.00
Rodent Control		9.75	0.00	2.30	12.05
Irrigation & Water Assessment		0.00	9.00	59.00	68.00
Ladders, Pruning & Picking Equipment		0.00	2.15	0.00	2.15
Harvest		240.20	4.73	15.00	259.93
Picking 100 buckets x 2.15=215.00					
General Labor 3.6 hours x 7.00=25.20					
Forklift .50 hours x 30.00=15.00					
Commission Assessments		0.00	0.00	19.50	19.50
Pickups, Trucks & ATV's		0.00	50.21	0.00	50.21
Labor Facilities - Repairs & Maintenance		0.00	0.00	9.41	9.41
Miscellaneous		0.00	0.00	50.00	50.00
Interest: Operating Capital		0.00	0.00	12.66	12.66
Total VARIABLE COSTS		327.19	110.04	419.50	856.73
GROSS INCOME minus VARIABLE COSTS					-156.73

¹ Refer to Table 3 for quantities per acre, cost per unit, cost per acre and cost per applied acre.² Refer to Table 4 for quantities per acre, cost per unit, and cost per acre.

Table 12. Sweet Cherries, Establishment Year 5, \$/Acre Economic Costs and Returns (continued).

<u>FIXED COSTS</u>	<u>Description</u>	<u>Units</u>	<u>Total</u>
CASH Costs			
	Machinery and Equipment Insurance	acre	4.71
	Pickups, Trucks & ATV's Insurance	acre	3.48
	Property Insurance, etc.	acre	50.00
	Property Taxes	acre	45.00
Total CASH Costs			103.19
NON-CASH Costs			
	Machinery and Equipment Depreciation, Interest & Housing	acre	246.29
	Pickups, Trucks & ATV's Depreciation, Interest & Housing	acre	73.00
	Labor Facilities Depreciation & Interest	acre	31.37
	Owner Labor	acre	111.52
	Land Interest Charge	acre	350.00
	Interest on Accumulative Investment	acre	871.40
Total NON-CASH Costs			1,683.58
Total FIXED COSTS			1,786.77
Total of All Costs Per Acre			2,643.50
NET PROJECTED RETURNS			-1,943.50

Table 13. Sweet Cherries, Establishment Year 6, \$/Acre Economic Costs and Returns.

<u>GROSS INCOME</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>\$/Unit</u>	<u>Total</u>
Sweet Cherries		4,000	pounds	0.35	1,400.00
Total GROSS Income					1,400.00
<u>VARIABLE COSTS</u>	<u>Description</u>	<u>Labor</u>	<u>Machinery</u>	<u>Materials</u>	<u>Total</u>
Train and Prune		39.00	0.00	0.00	39.00
Tree Removal (1 tree)		1.63	1.69	12.50	15.82
Tree Replacement (1 tree)		1.63	1.25	7.06	9.94
Rake and Shred Brush		6.50	6.09	0.00	12.59
Fertilizer - Broadcast Applied		0.00	1.85	19.50	21.35
Ammon. Nit.	200 pounds x .0975=19.50				
Fertilizer - Foliar Applied		0.00	0.00	5.13	5.13
Solubor	5.0 pounds x .75=3.75				
Zinc-50	1.2 pounds x 1.15=1.38				
Herbicide - Strip Maintenance (.33x) ¹		0.00	3.37	39.36	42.73
Disease Control		1.63	4.57	33.10	39.30
Rovral 50wp	1.0 pound x 24.10=24.10				
D. Flow. Sulfur	10.0 pounds x .90=9.00 (2x)				
Insecticides ²		1.63	2.29	69.23	73.15
Growth Regulator		0.00	0.00	32.50	32.50
Pro-Gibb 4%	1.0 pint x 32.50=32.50				
Mowing (5x)		16.25	23.92	0.00	40.17
Hive Rental		0.00	0.00	22.00	22.00
Rodent Control		9.75	0.00	2.30	12.05
Irrigation & Water Assessment		0.00	9.00	59.00	68.00
Ladders, Pruning & Picking Equipment		0.00	2.15	0.00	2.15
Harvest		480.40	9.45	30.00	519.85
Picking	200 buckets x 2.15=430.00				
General Labor	7.2 hours x 7.00=50.40				
Forklift	1.0 hours x 30.00=30.00				
Commission Assessments		0.00	0.00	39.00	39.00
Pickups, Trucks & ATV's		0.00	50.21	0.00	50.21
Labor Facilities - Repairs & Maintenance		0.00	0.00	9.41	9.41
Miscellaneous		0.00	0.00	50.00	50.00
Interest: Operating Capital		0.00	0.00	16.57	16.57
Total VARIABLE COSTS					1,120.92
GROSS INCOME minus VARIABLE COSTS					279.08

¹ Refer to Table 3 for quantities per acre, cost per unit, cost per acre and cost per applied acre.

² Refer to Table 4 for quantities per acre, cost per unit, and cost per acre.

Table 13. Sweet Cherries, Establishment Year 6, \$/Acre Economic Costs and Returns (continued).

<u>FIXED COSTS</u>	<u>Description</u>	<u>Units</u>	<u>Total</u>
CASH Costs			
	Machinery and Equipment Insurance	acre	5.51
	Pickups, Trucks & ATV's Insurance	acre	3.48
	Property Insurance, etc.	acre	50.00
	Property Taxes	acre	45.00
Total CASH Costs			103.99
NON-CASH Costs			
	Machinery and Equipment Depreciation, Interest & Housing	acre	259.50
	Pickups, Trucks & ATV's Depreciation, Interest & Housing	acre	73.00
	Labor Facilities Depreciation & Interest	acre	31.37
	Owner Labor	acre	116.88
	Land Interest Charge	acre	350.00
	Interest on Accumulative Investment	acre	1,065.80
Total NON-CASH Costs			1,896.55
Total FIXED COSTS			2,000.54
Total of All Costs Per Acre			3,121.46
NET PROJECTED RETURNS			-1,721.46

Table 14. Sweet Cherries, Establishment Year 7, \$/Acre Economic Costs and Returns.

<u>GROSS INCOME</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>\$/Unit</u>	<u>Total</u>
Sweet Cherries		6,000	pounds	0.35	2,100.00
Total GROSS Income					2,100.00
<u>VARIABLE COSTS</u>	<u>Description</u>	<u>Labor</u>	<u>Machinery</u>	<u>Materials</u>	<u>Total</u>
Train and Prune		65.00	0.00	0.00	65.00
Tree Removal (1 tree)		2.60	1.69	25.00	29.29
Tree Replacement (1 tree)		1.63	1.25	7.06	9.94
Rake, Shred & Brush Removal		9.75	6.09	0.00	15.84
Fertilizer - Broadcast Applied		0.00	0.74	19.50	20.24
Ammon. Nit.	200 pounds x .0975=19.50				
Fertilizer - Foliar Applied		0.00	0.00	12.95	12.95
Solubor	5.0 pounds x .75=3.75				
Zinc-50	8.0 pounds x 1.15=9.20				
Herbicide - Strip Maintenance (.33x) ¹		0.00	1.69	39.36	41.05
Disease Control		3.25	9.15	33.10	45.50
Rovral 50wp	1.0 pound x 24.10=24.10				
D. Flow. Sulfur	10.0 pounds x .90=9.00 (2x)				
Insecticides ²		0.00	2.29	69.23	71.52
Growth Regulator		0.00	0.00	48.75	48.75
Pro-Gibb 4%	1.5 pints x 32.50=48.75				
Mowing (5x)		16.25	23.92	0.00	40.17
Hive Rental		0.00	0.00	22.00	22.00
Rodent Control		9.75	0.00	2.30	12.05
Irrigation & Water Assessment		0.00	9.00	59.00	68.00
Ladders, Pruning & Picking Equipment		0.00	2.15	0.00	2.15
Harvest		720.60	14.18	37.50	772.28
Picking	300 buckets x 2.15=645.00				
General Labor	10.8 hours x 7.00=75.60				
Forklift	1.25 hours x 30.00=37.50				
Commission Assessments		0.00	0.00	58.50	58.50
Pickups, Trucks & ATV's		0.00	50.21	0.00	50.21
Labor Facilities - Repairs & Maintenance		0.00	0.00	9.41	9.41
Miscellaneous		0.00	0.00	50.00	50.00
Interest: Operating Capital		0.00	0.00	21.67	21.67
Total VARIABLE COSTS		828.83	122.36	515.33	1,466.52
GROSS INCOME minus VARIABLE COSTS					633.48

¹ Refer to Table 3 for quantities per acre, cost per unit, cost per acre and cost per applied acre.² Refer to Table 4 for quantities per acre, cost per unit, and cost per acre.

Table 14. Sweet Cherries, Establishment Year 7, \$/Acre Economic Costs and Returns (continued).

<u>FIXED COSTS</u>	<u>Description</u>	<u>Units</u>	<u>Total</u>
CASH Costs			
	Machinery and Equipment Insurance	acre	5.90
	Pickups, Trucks & ATV's Insurance	acre	3.48
	Property Insurance, etc.	acre	50.00
	Property Taxes	acre	45.00
Total CASH Costs			104.38
NON-CASH Costs			
	Machinery and Equipment Depreciation, Interest & Housing	acre	266.92
	Pickups, Trucks & ATV's Depreciation, Interest & Housing	acre	73.00
	Labor Facilities Depreciation & Interest	acre	31.37
	Owner Labor	acre	113.05
	Land Interest Charge	acre	350.00
	Interest on Accumulative Investment	acre	1,237.90
Total NON-CASH Costs			2,072.24
Total FIXED COSTS			2,176.62
Total of All Costs Per Acre			3,643.14
NET PROJECTED RETURNS			-1,543.14

Table 15. Sweet Cherries, Establishment Year 8, \$/Acre Economic Costs and Returns.

<u>GROSS INCOME</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>\$/Unit</u>	<u>Total</u>
Sweet Cherries		10,000	pounds	0.35	3,500.00
Total GROSS Income					3,500.00
<u>VARIABLE COSTS</u>	<u>Description</u>	<u>Labor</u>	<u>Machinery</u>	<u>Materials</u>	<u>Total</u>
Train and Prune		78.00	0.00	0.00	78.00
Tree Removal (1 tree)		0.00	1.69	25.00	26.69
Tree Replacement (1 tree)		1.63	1.25	7.06	9.94
Rake, Shred & Brush Removal		9.75	9.46	0.00	19.21
Fertilizer - Broadcast Applied		0.00	0.74	24.38	25.12
Ammon. Nit.	250 pounds x .0975=24.38				
Fertilizer - Foliar Applied		0.00	0.00	12.95	12.95
Solubor	5.0 pounds x .75=3.75				
Zinc-50	8.0 pounds x 1.15=9.20				
Herbicide - Strip Maintenance (.33x) ¹		0.00	1.69	39.36	41.05
Disease Control		3.25	9.15	55.10	67.50
Rovral 50wp	1.0 pound x 24.10=24.10				
D. Flow. Sulfur	10.0 pounds x .90=9.00 (2x)				
Copper	10.0 pounds x 2.20=22.00				
Insecticides ²		0.00	2.29	69.23	71.52
Growth Regulator		0.00	0.00	48.75	48.75
Pro-Gibb 4%	1.5 pints x 32.50=48.75				
Mowing (5x)		16.25	23.92	0.00	40.17
Hive Rental		0.00	0.00	33.00	33.00
Rodent Control		9.75	0.00	2.30	12.05
Irrigation & Water Assessment		0.00	9.00	59.00	68.00
Ladders, Pruning & Picking Equipment		0.00	2.15	0.00	2.15
Harvest		1,201.00	23.64	45.00	1,269.64
Picking	500 buckets x 2.15=1,075.00				
General Labor	18.0 hours x 7.00=126.00				
Forklift	1.50 hours x 30.00=45.00				
Commission Assessments		0.00	0.00	97.50	97.50
Pickups, Trucks & ATV's		0.00	50.21	0.00	50.21
Labor Facilities - Repairs & Maintenance		0.00	0.00	9.41	9.41
Miscellaneous		0.00	0.00	50.00	50.00
Interest: Operating Capital		0.00	0.00	30.49	30.49
Total VARIABLE COSTS		1,319.63	135.19	608.53	2,063.35
GROSS INCOME minus VARIABLE COSTS					1,436.65

¹ Refer to Table 3 for quantities per acre, cost per unit, cost per acre and cost per applied acre.² Refer to Table 4 for quantities per acre, cost per unit, and cost per acre.

Table 15. Sweet Cherries, Establishment Year 8, \$/Acre Economic Costs and Returns (continued).

<u>FIXED COSTS</u>	<u>Description</u>	<u>Units</u>	<u>Total</u>
CASH Costs			
	Machinery and Equipment Insurance	acre	7.24
	Pickups, Trucks & ATV's Insurance	acre	3.48
	Property Insurance, etc.	acre	50.00
	Property Taxes	acre	45.00
Total CASH Costs			105.72
NON-CASH Costs			
	Machinery and Equipment Depreciation, Interest & Housing	acre	292.86
	Pickups, Trucks & ATV's Depreciation, Interest & Housing	acre	73.00
	Labor Facilities Depreciation & Interest	acre	31.37
	Owner Labor	acre	124.95
	Land Interest Charge	acre	350.00
	Interest on Accumulative Investment	acre	1,392.20
Total NON-CASH Costs			2,264.38
Total FIXED COSTS			2,370.10
Total of All Costs Per Acre			4,433.45
NET PROJECTED RETURNS			-933.45

Table 16. Sweet Cherries, Full Production Years, \$/Acre Economic Costs and Returns.

<u>GROSS INCOME</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>	<u>\$/Unit</u>	<u>Total</u>
Sweet Cherries		16,000	pounds	0.35	5,600.00
Total GROSS Income					5,600.00
<u>VARIABLE COSTS</u>	<u>Description</u>	<u>Labor</u>	<u>Machinery</u>	<u>Materials</u>	<u>Total</u>
Train and Prune		84.50	0.00	0.00	84.50
Tree Removal (1 tree)		0.00	1.80	25.00	26.80
Tree Replacement (1 tree)		1.63	0.82	7.06	9.51
Rake, Shred & Brush Removal		13.00	6.09	0.00	19.09
Fertilizer - Broadcast Applied		0.00	0.74	32.18	32.92
Ammon. Nit.	330 pounds x .0975=32.18				
Fertilizer - Foliar Applied		0.00	0.00	12.95	12.95
Solubor	5.0 pounds x .75=3.75				
Zinc-50	8.0 pounds x 1.15=9.20				
Herbicide - Strip Maintenance (.33x) ¹		0.00	1.68	39.36	41.04
Disease Control		3.25	9.15	59.60	72.00
Rovral 50wp	1.0 pound x 24.10=24.10				
D. Flow. Sulfur	15.0 pounds x .90=13.50 (2x)				
Copper	10.0 pounds x 2.20=22.00				
Insecticides ²		0.00	2.29	69.23	71.52
Growth Regulator		0.00	0.00	48.75	48.75
Pro-Gibb 4%	1.5 pints x 32.50=48.75				
Mowing (5x)		16.25	23.92	0.00	40.17
Hive Rental		0.00	0.00	44.00	44.00
Rodent Control		9.75	0.00	2.30	12.05
Irrigation & Water Assessment		0.00	9.00	59.00	68.00
Ladders, Pruning & Picking Equipment		0.00	2.15	0.00	2.15
Harvest		1,919.50	34.57	60.00	2,014.07
Picking	800 buckets x 2.15=1,720.00				
General Labor	28.5 hours x 7.00=199.50				
Forklift	2.0 hours x 30.00=60.00				
Commission Assessments		0.00	0.00	156.00	156.00
Pickups, Trucks & ATV's		0.00	50.21	0.00	50.21
Labor Facilities - Repairs & Maintenance		0.00	0.00	9.41	9.41
Miscellaneous		0.00	0.00	50.00	50.00
Interest: Operating Capital		0.00	0.00	42.65	42.65
Total VARIABLE COSTS		2,047.88	142.42	717.49	2,907.79
GROSS INCOME minus VARIABLE COSTS					2,692.21

¹ Refer to Table 3 for quantities per acre, cost per unit, cost per acre and cost per applied acre.² Refer to Table 4 for quantities per acre, cost per unit, and cost per acre.

Table 16. Sweet Cherries, Full Production Years, \$/Acre Economic Costs and Returns (continued).

<u>FIXED COSTS</u>	<u>Description</u>	<u>Units</u>	<u>Total</u>
CASH Costs			
	Machinery and Equipment Insurance	acre	7.97
	Pickups, Trucks & ATV's Insurance	acre	3.48
	Property Insurance, etc.	acre	50.00
	Property Taxes	acre	45.00
Total CASH Costs			106.45
NON-CASH Costs			
	Machinery and Equipment Depreciation, Interest & Housing	acre	311.86
	Pickups, Trucks & ATV's Depreciation, Interest & Housing	acre	73.00
	Labor Facilities Depreciation & Interest	acre	31.37
	Owner Labor	acre	133.45
	Land Interest Charge	acre	350.00
	Amortized Establishment Cost	acre	1,540.31
Total NON-CASH Costs			2,439.99
Total FIXED COSTS			2,546.44
Total of All Costs Per Acre			5,454.23
NET PROJECTED RETURNS			145.77
	Break-Even Price, Total Variable Cost	\$0.18 per lb	
	Break-Even Price, Total Cost	\$0.34 per lb	
	Break-Even Yield, Total Variable Cost	8,308 lbs	
	Break-Even Yield, Total Cost	15,584 lbs	



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