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Michigan Production Costs for Tart Cherries by Production Region

By

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Executive Summary

- The weighted average cost of producing tart cherries in Michigan on a representative farm in 2009 is $0.36/lb. This cost was averaged across the three main production regions in Michigan and weighted by average per acre production for each region as published by the Michigan Agricultural Statistics Service.
- Costs vary across the main production regions and by farm size. Costs are about $0.04/lb less for mid-sized farms in Northwest Michigan and $0.08/lb and $0.10/lb in West Central and Southwest Michigan, respectively.
- This report was developed through interviews with tart cherry growers and other experts in each of the three main growing regions in 2005 and 2006. Many of the numbers were updated in 2009.
- The cost of production calculation is based on estimates of operating costs, harvest costs, and management, interest and tax costs. It also includes an amortized cost of establishing an orchard and employing the land in production (versus some other use). The following tables summarize the cost findings for each of the production regions.

Northwest mid-sized grower

COST	*$/ACRE*
Operating costs	$688.47
Harvest costs	$652.57
Management, interest and taxes	$302.45
Total production costs	$1,643.49
Amortized cost of orchard establishment and land cost	$1,031.39
Total production, land and establishment costs	**$2,674.79**
Total costs/lb	**$0.32**
Total variable production costs/lb	**$0.18**

Southwest mid-sized grower

COST	*$/ACRE*
Operating costs	$673.06
Harvest costs	$732.14
Management, interest and taxes	$156.35
Total production costs	$1,561.55
Amortized cost of orchard establishment and land cost	$909.15
Total production, land and establishment costs	**$2470.00**
Total costs/lb	**$0.45**
Total variable production costs/lb	**$0.28**

West Central mid-sized grower

COST	*$/ACRE*
Operating costs	$712.75
Harvest costs	$595.28
Management, interest and taxes	$174.96
Total production costs	$1,657.95
Amortized cost of orchard establishment and land cost	$909.15
Total production, land and establishment costs	**$2,567.10**
Total costs/lb	**$0.42**
Total variable production costs/lb	**$0.27**

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Abstract

The cost of producing tart cherries in NW Michigan on a representative mid-sized farm is $0.32/lb. This cost is based upon an economic life-cycle which includes establishment years, production years, and a 22 year bearing period. The yields used in the calculation take into account MASS/NASS estimates since the mid 1990's excluding the year of the unprecedented wind freeze (2002). The costs are lower for the largest farms and significantly higher in the WC and SW regions.

Introduction

The tart cherry growing area extends along the western side of Michigan along Lake Michigan as shown in Figure 1. The area is divided into three regions based upon differences in growing conditions and the role of cherries in the farm plan. The regions are Northwest (NW), West Central (WC), and Southwest (SW). The NW region contains half of Michigan's tart cherry acreage with the largest acreage in Leelanau and Grand Traverse counties and significant acreage in Benzie, Antrim and Charlevoix counties. Oceana has most of the acreage in the WC region followed by Mason. Van Buren and Berrien are the dominant counties in the SW.

Figure 1. Michigan's Cherry Production Regions

Tart cherries have traditionally been the dominant crop in the NW region and tree-fruit farms in the region are generally specialized. Typically, at least 50% of the acreage in the NW is devoted to tart cherry production with much of the remaining acreage split between sweet cherry and apple production. The SW region, in contrast, is more diversified with a wide range of fruits including apples, grapes, peaches, and tart and sweet cherries. On the average, yields have been higher in the NW than in the WC and SW regions.

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Objectives

The objectives of this report are to:

- Calculate the cost/lb of cherries for a "representative" farm for each of the regions.
- Describe the methods used to estimate the cost/lb for marketable cherries, over the block's life-cycle, for NW, WC, and SW Michigan farms using growing and harvesting practices representative of each of these regions.
- Describe how the information used to calculate the cost was obtained.
- Determine the annual cash requirements for each stage of the tart cherry life-cycle.

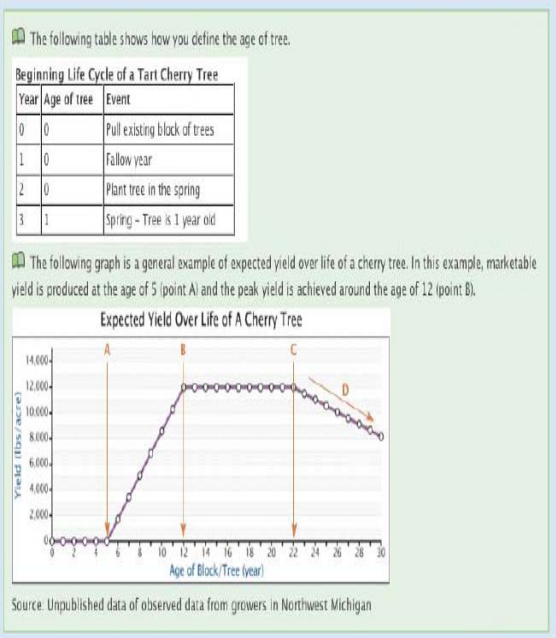
Framing the Cost of Production Calculation

Farmers considering investing in a new block or replanting an existing block want to know if the block will be profitable over the block's economic lifespan. They recognize the tart cherry industry is risky with highly variable yields, prices, and revenues but farmers want revenues that, on the average, cover costs over the lifetime of the block.

A starting point is establishing a projected cost of production per lb of cherries. The cost must include: (1) cash required for getting the block into production; (2) the land control costs for the time period of getting the block into production; (3) crop protection expenditures, fertilizer, labor, machinery, building and equipment costs, and harvest and handling costs during the bearing years; (4) land control costs during the bearing years; and (5) management and supervision costs. These costs include a rate of return on equity capital and a charge for unpaid family labor and management. The final component is projected average yield/acre during the bearing years.

Cherries, like other perennial tree crops, have a life-cycle which includes an establishment stage, a ramping up to maturity stage, a maturity stage, and a declining production stage as illustrated in the example in Figure 2. Several years of cash outflows occur prior to any revenue generation. As production ramps up, cash inflows begin to exceed cash requirements resulting in a positive annual net cash flow.

The average annual costs per lb of marketable fruit over the entire life-cycle of the tree must be assessed – the life cycle cost. Budgeting procedures employed must standardize cash flows to account for the timing and risk involved during the tart cherry tree life-cycle.


The following table shows how you define the age of tree.

Beginning Life Cycle of a Tart Cherry Tree

Year	Age of tree	Event
0	0	Pull existing block of trees
1	0	Fallow year
2	0	Plant tree in the spring
3	1	Spring - Tree is 1 year old

The following graph is a general example of expected yield over life of a cherry tree. In this example, marketable yield is produced at the age of 5 (point A) and the peak yield is achieved around the age of 12 (point B).

Source: Unpublished data of observed data from growers in Northwest Michigan

Figure 2. Hypothetical Lifecycle

The 1st step is calculation of the cash requirements for the establishment period. The cash required in each year plus the accumulated interest until the beginning bearing year is summed. Likewise, the accumulated annual cost of having land tied up during the establishment period is calculated. These expenditures are amortized over the bearing years. Think of this step as acquiring a "ready to bear" block.

In the 2nd step, the annual production and harvesting cost during the bearing years, including land control cost is calculated. The amortized establishment cost is added to get the average annual total cost per acre during the bearing years. This cost is divided by the average yield across the bearing years to get the cost per lb. This approach was used in prior tart cherry cost of production studies for Northwest Michigan (for example, E-1108, 2003).

Figure 3 depicts an example of annual cash flows over a block's life-cycle.

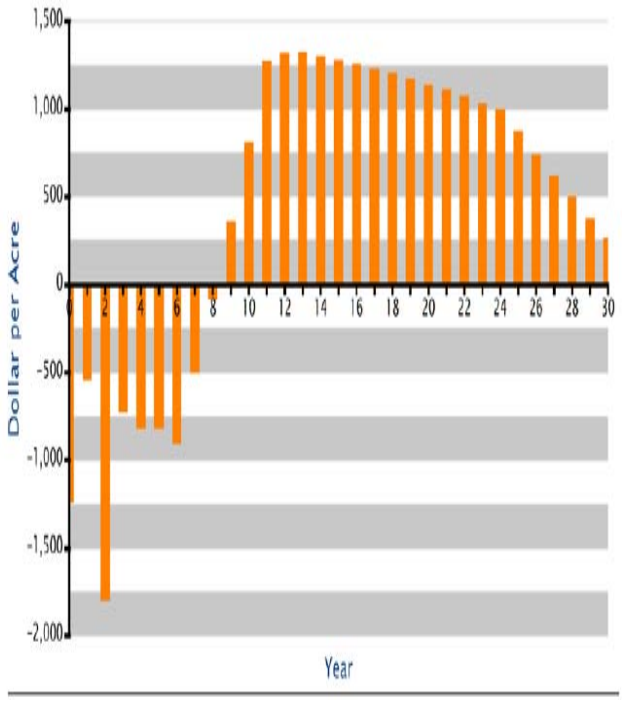


Figure 3. Annual net cash flow

The cost/lb of cherries is a "break-even" price. It is the price/lb the farm would have to receive, over the block's life-cycle, to cover all of the annual cash requirements. This study calculates the cherry price required to justify investing in (or, replacing) a block of cherries to ensure getting a target rate of return on equity capital, covering the annual cost of using land, the opportunity cost of family labor and management, and other allocated costs

Method Used to Obtain the Required Information: Focus Groups

The projected costs were developed through focus group discussions with cherry growers in each of the production regions. Separate focus groups were conducted in each region and separate focus groups were conducted for mid-sized versus larger farms in the NW. In the discussions, farmers described growing and harvesting practices of representative cherry growers in their region. They also agreed on the size of tart cherry acreage, equipment and cultural practices generally used by growers. The estimates do not reflect the cost of tart cherry production for specific farms since costs vary considerably by site and from farm to farm. They are expected to be "representative" of the region. The data can provide an outline to help you develop cost information and better evaluate your farm situation. Each of the appropriate tables in this report includes a "Your Farm" column for you to note your cost for a particular operation. Where your costs cannot be determined, you may wish to adjust and substitute the study data.

The information on spray costs was based on actual amounts applied, averaged across participating farms, but with materials at a common price and application cost. These costs were averaged for the mid-sized and larger farms in the NW region because the inter-farm variability was too large to permit differentiation. The data are standardized to a one acre basis for ease of comparison.

Michigan Agricultural Statistics (MASS) production and yield data and rotational survey data were used to estimate the yields/acre in the cost/lb calculations.

Calculating Costs of Production

Each of these component cost groups and stages of the life-cycle are discussed in this section prior to the presentation of the tables of results.

Labor Costs

Focus groups were asked to examine the set of tasks performed and to determine the skill level required to perform each task. It is recognized that there is some degree of error is establishing labor costs in this manner because of the necessity to employ skilled labor full-time and therefore using skilled labor to perform tasks that may be able to be performed by unskilled labor in some cases. Overall, however, the skill level was matched as closely as possible to the task being performed by growers. The categories used were: (1) owner; (2) manager/supervisor; (3) skilled, year-round; (4) skilled hourly; and (5) unskilled hourly.

Labor costs, by skill level, including fringes are shown in Table 1. Wages and fringe benefits vary by size of operation and by the production region.

Tables 1a and 1b provide labor costs for the NW growing region for mid-sized and large growers, respectively. Table 1c and 1d show labor for the SW and WC region, respectively.

Establishment Cost

The costs of establishing a new orchard include all cash outlays incurred prior to the bearing years. They also include the accumulated annual costs of controlling land. Under Approach 1, these outlays are capitalized into a single establishment cost and amortized annually against the cost of the bearing block. That is, an annual depreciation and interest charge is assessed against the bearing block.

Cash outlays associated with establishment of a new block will vary widely across farms and costs are sensitive to the management practices employed (i.e. site preparation methods, costs and cultural practices). Cash outlays for establishment are presented in Table 2 and are treated as equal for farms in all growing regions. The labor costs for the mid-sized farm group in the NW region were used in the calculations.

The annual land costs used are discussed under the land cost section. A 22 year bearing life and an 8% interest rate were used in calculating the annual amortized cost.

Production and Harvest Costs

Non-land costs were separated into categories including pruning, mowing, crop protection, borer control, herbicide, fertilizer, bee rental, pest management, pickup truck use, harvest costs, interest on operating, and management and supervision costs. They are calculated by region and are presented in Table 3. Tables 3a and 3b show the non-land costs for the NW growing region for mid-sized and large producers, respectively. Tables 3c and 3d show the costs for the SW and WC regions, respectively.

Part 1 of Table 3 covers the pre-harvest costs; Part 2 covers harvest costs. Part 2 also covers the cost of management and labor supervision and interest on operating capital.

Specific tasks are described by hours required per acre. Costs are broken out by labor, materials, and equipment. Equipment costs are divided into cash and non-cash components. Harvest costs include the cooling pad operating and shipping. The ½ cent per pound tart cherry assessment was included in Table 3.

The core harvest costs are varied with yield in the sensitivity analysis tables where the impact of yield on cost/lb is calculated. Cost per acre is set at 85% of peak bearing age cost when bearing begins and rises to 100% when trees reach peak bearing age.

The machinery cost calculations are presented in the Appendix in Table 4 and fertilizer use rates, prices and costs are presented in Table 5.

Production costs have increased substantially since 2003 when E-1108 was last published. This is a result of increases in many prices levels, particularly petroleum based inputs, machinery, and wages. Fuel costs are based upon $2.65/gal diesel; fertilizer prices are based upon projected 2009 prices.

Land Control Cost

Estimation of the annual cost of controlling land has been a challenge. The approach taken is to calculate the opportunity cost of what the capital invested in land could earn elsewhere less the expected annual appreciation (capital gains) to arrive at a net cost per year. An 8% interest rate was used for the opportunity cost. The cost of "controlling" land is site and situation specific; these estimates provide a starting point.

Land in the NW was priced at $7,000/acre and a 3.5%/year appreciation was used. This results in an annual net cost, prior to property tax, of $315/acre:

Opportunity cost @ 8%	$560	
Less Capital gains @ 3.5%/yr	245	
Net cost/bearing acre		$315

Land in the SW and WC was priced at $4,000/acre and a 2.0%/year appreciation was used. This results in an annual net cost, prior to property tax, of $240/acre:

Opportunity cost @ 8%	$320	
Less Capital gains @ 2.0%/yr	80	
Net cost/bearing acre		$240

These estimates are conservative since land in cherries is only part of a parcel of land.

Marketable Yield

The estimated cost per lb is calculated by dividing the average annual cost/acre during the bearing years by the average yield/acre. Figure 3, based upon Michigan Agricultural Statistics, depict the average yield/acre by region since the mid 90's.

In the late 90's, a larger proportion of trees were in the prime producing ages than would be expected over the lifetime of a block. Also, in 2001 conditions were exceptional by historical standards and reflected in an outstanding crop. The near zero yields in 2002 reflected a systemic "wind" freeze that was very unusual. Losses that extensive had not been observed in recorded history.

The average annual yields/acre during the bearing years used these data as reference points. Data that are used in the cost/unit calculation are 9000, 6300, and 5,600 lbs/acre for the NW, WC, and SW regions, respectively. The 2002 yields were not used in developing the reference yields. MASS yields were adjusted for the planting density assumed in the budgets and the intensity of input use.

Cost/Lb of Cherries

The 1st step is to calculate the annual cost for establishing the block. We start by taking the annual values from Table 2 and summing and amortizing. That translates into $518.30/year based upon a 22 year bearing life and an 8% interest rate for the NW farms. We do the same calculation with annual land control costs. The amortized cost is $198/ year for the bearing years.

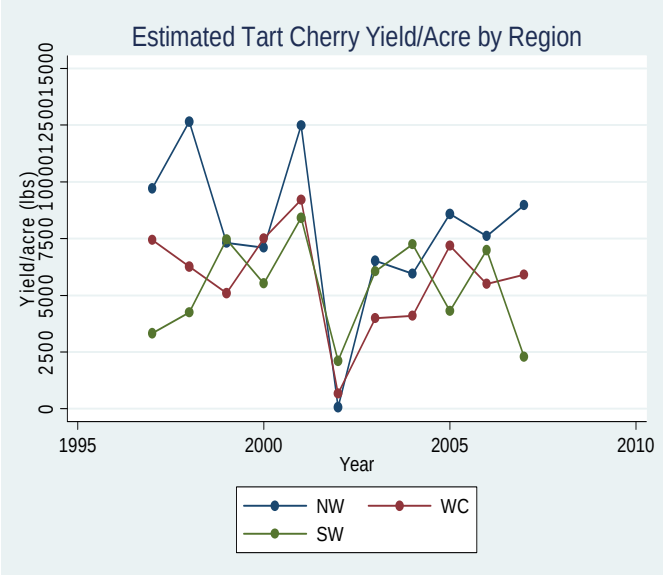


Figure 3. Tart Cherry Yield/Acre by Region

Annual production costs/acre, including harvest and the check-off, are $1643.49 for the mid-sized NW farm (table 3a) . Putting all the cost components together, we get:

Amortized establishment cost/year	
Non-land component	$518.30
Land component	198.00
Annual bearing year	
Non-land cost	1,643.49
Land (net)	315.00
Total /year during bearing years	2,674.79

The annual cost/bearing year is divided by the average yield/bearing acre to get the cost/lb of cherries. However, one additional adjustment must be made; the yield – cherry price correlation must be taken into account. The yield-price correlation is a result of the large percentage of the national crop grown in Michigan, particularly NW Michigan.

Historically, the multiplication of the average yield times the average price generates higher gross revenue/acre than the observed gross revenue. For the NW region, the difference was 7%. Thus, an adjustment factor of 0.93 is used for the NW.

The estimated cost/lb for the representative mid-sized farm in NW is

$$\$0.32/\text{lb} = \frac{\$2,675/\text{acre/ year}}{9,000\ \text{lbs}/\ year \times 0.93}.$$

The estimated cost for a representative NW larger farm was $0.01/lb less (see table 3b). Part of the reason for the narrow difference in the calculation was establishment costs, herbicide costs, fertilizer costs, and land control costs were assumed to be the same for both groups as was yield.

The annual production costs/acre, including harvest and the check-off, are $1,561.55 for a representative SW farm (table 3c). Putting all the cost components together, we get:

Amortized establishment cost/year	
Non-land component	$518.30
Land component	150.85
Annual bearing year	
Non-land cost	1,561.55
Land (net)	240.00
Total /year during bearing years	2,473.70

Historically, the multiplication of the average yield times the average price generates higher gross revenue/acre than the observed gross revenue as in the NW. For the SW region, the difference was 2-3% since it produces a much smaller proportion of national production than the NW. Thus, an adjustment factor of 0.98 is used for the SW.

The estimated cost/lb for a representative farm in SW is $\$0.45/\text{lb} = \frac{\$2,473/\text{acre/ year}}{5,600\ \text{lbs}/\ year \times 0.98}$.

Annual production costs/acre, including harvest and the check-off, are $1,657.95 for a representative WC farm (table 3d). Putting all the cost components together, we get:

Amortized establishment cost/year	
Non-land component	$518.30
Land component	150.85
Annual bearing year	
Non-land cost	1,657.95
Land (net)	240.00
Total /year during bearing years	2,567.10

Historically, the multiplication of the average yield times the average price generates higher gross revenue/acre than the observed gross revenue. For the NW region, the difference was 4%, intermediate between the NW and SW. Thus, an adjustment factor of 0.96 is used for the WC.

The estimated cost/lb for a representative farm in WC is $\$0.42/\text{lb} = \frac{\$2,567/\text{acre/ year}}{6,300\ \text{lbs}/\ year \times 0.96}$.

The approach has ignored income tax considerations. They typically reduce the cost of capital because of interactions with tax based depreciation – assuming the farm pays income taxes. However, the approach underestimates the time value of money. The effects approximately offset.

Table 1. Cost of Labor for Tart Cherry Production in Michigan (includes fringes)

A. Cost of Labor for Tart Cherry Production in Northwest Growing Region for Mid-sized Growers

NW Region -- Mid-sizeder Scale Growers			
	Salaries	**Benefits**	**Total**
Skill Level	**$/hr**	**%**	**$/hr**
Owner	$25.00	15.30%	$28.83
Manager/Supervisor	NA	NA	NA
Skilled, year-round	$16.50	11.40%	$18.38
Skilled, hourly	$13.00	11.40%	$14.48
*Unskilled, hourly	$9.50	11.40%	$10.58

B. Cost of Labor for Tart Cherry Production in Northwest Growing Region for Large Scale Growers

NW Region -- Larger Scale Growers			
	Salaries	**Benefits**	**Total**
Skill Level	**$/hr**	**%**	**$/hr**
Owner	NA	NA	NA
Manager/Supervisor	$22.00	53.50%	$33.77
Skilled, year-round	$17.00	55.80%	$26.49
Skilled, hourly	$11.50	22.50%	$14.09
*Unskilled, hourly	$10.00	22.50%	$12.25

C. Cost of Labor for Tart Cherry Production in Southwest Growing Region

South-west Region			
	Salaries	**Benefits**	**Total**
Skill Level	**$/hr**	**%**	**$/hr**
Owner	$25.00	15.30%	$28.83
Manager/Supervisor	NA	NA	NA
Skilled, year-round	$14.00	28.00%	$17.92
Skilled, hourly	$10.00	17.50%	$11.75
*Unskilled, hourly	$7.50	17.50%	$8.81

D. Cost of Labor for Tart Cherry Production in West Central Growing Region

West Central Region			
	Salaries	**Benefits**	**Total**
Skill Level	**$/hr**	**%**	**$/hr**
Owner	$25.00	15.30%	$28.83
Manager/Supervisor	NA	NA	NA
Skilled, year-round	$14.00	61.50%	$22.61
Skilled, hourly	$10.50	19.50%	$12.55
*Unskilled, hourly	$8.25	19.50%	$9.86

Table 2. Costs of Establishing Tart Cherry Orchard

Operation	Cost/acre ($)
Year 0--Site Preparation & Fallow:	
Orchard removal & clean-up	$600.00
Plowing and Cover crop	$300.00
Total Site Prep. Costs	$900.00
Year 1--Planting Costs:	
Plowing	$22.00
Nematicide	$150.00
Surveying	$24.10
Trees:	$1,031.25
Planting,	$56.25
Mulch (1/2 bale straw/ tree)	$200.00
Total Planting Costs	$1,483.60
Cultural Costs:	
Permanent seeding	$37.91
Pest Control (4x)	$58.29
Herbicide	$25.50
Mouse baiting	$10.22
Fertilizer	$37.00
Deer Control @ $.50/tree	$62.50
Management	$40.00
Property tax	$30.00
Total Cultural Costs	$301.42
Total- Year 1	$1,785.02
Year 2--Growing costs:	
Pruning (1 hr/ac)	$15.91
Tree replacement (1%)	$20.48
Herbicide	$27.17
Pest Control--5x	$72.86
Mowing--2x	$15.58
Mouse control	$10.22
Fertilizer-labor & equip.	$13.04
Fertilizer-material (1 lb./tree)	$21.00
Deer control ($0.50/tree)	$62.50
Management (1.5 hr/ac)	$30.00
Property tax	$30.00
Total- Year 2	$318.76
Year 3--Growing costs:	
Pruning (3 hr/ac)	$47.90
Tree replacement (0.5%)	$10.24
Herbicide	$27.17
Pest Control--5x	$89.11
Mowing--3x	$23.37
Mouse control	$10.22
Fertilizer-labor & equip.	$13.04
Fertilizer-material (2 lb./tree)	$42.00
Deer control ($0.50/tree)	$37.50
Management (1.5 hr/ac)	$30.00
Property tax	$30.00
Total- Year 3	$360.55
Year 4--Growing costs:	
Pruning (4 hr/ac)	$63.64
Herbicide	$27.17
Pest Control--5x	$107.74
Mowing--3x	$23.37
Mouse control	$10.22
Fertilizer-labor & equip.	$13.04
Fertilizer-material (3 lb./tree)	$63.00
Management (2 hr/ac)	$40.00
Property tax	$30.00
Total- Year 4	$378.18
Year 5--Growing costs:	
Pruning (5 hr/ac)	$79.55
Herbicide	$27.17
Pest Control--5x	$129.11
Mowing--3x	$23.27
Mouse control	$10.22
Fertilizer-labor & equip.	$13.04
Fertilizer-material (4 lb./tree)	$84.00
Management (3 hr/ac)	$60.00
Property tax	$30.00
Total- Year 5	$456.36
Total Establishment costs	$4,198.87

Table 3. Cash and Labor Costs per Acre
Table 3a. Northwest Mid-sized Growers

Northwest Mid-sized growers Cash and Labor Costs per acre Based on average saleable yield over its bearing lifetime of 9,000 lbs/acre (85 lbs/tree during peak bearing years)										
	Time	**Labor**	**Materials**	**Equipment**		**Total**		**Total**		**Your Farm**
Operation	*(Hrs/A)	Cash ($/hour)	Cash ($/Acre)	Cash ($/Hour)	Non-cash ($/Hour)	Cash ($/Acre)	Non-cash ($/Acre)	Cash ($/Acre)	Non-cash ($/Acre)	
Pruning								$92.35	$6.96	
-Pruning-Chain Saw	6	$12.25		$0.30		$75.30	$0.00			
-Brush Disposal-75 HP Tractor	0.42	$18.38		$18.76	$9.71	$15.60	$4.08			
-Flail Chopper	0.42			$3.46	$6.86	$1.45	$2.88			
Mowing								$19.76	$2.22	
-60 HP used Tractor	0.45	$14.48		$28.73	$1.73	$19.44	$0.78			
-Rotary Mower	0.45			$0.70	$3.21	$0.32	$1.44			
Crop Protection								$308.83	$32.67	
-75 HP Tractor	0.98			$18.76	$9.71	$18.38	$9.52			
-Orchard Sprayer	0.98			$3.05	$12.43	$2.99	$23.16			
-Total Insecticide			$58.30			$58.30	$0.00			
-Total Fungicide			$187.02			$187.02	$0.00			
-Total Plant Growth Regulators			$15.85			$15.85	$0.00			
-Total Spray Labor	1.43	$18.38				$26.28	$0.00			
Borer Control								$1.55	$0.66	
-75 HP Tractor	0.03			$18.76	$9.71	$0.56	$0.29			
-Orchard Sprayer	0.03			$3.05	$12.43	$0.09	$0.37			
-Total labor	0.04	$10.58	$0.47			$0.89	$0.00			
Herbicide								$31.43	$2.20	
-60 HP Used Tractor	0.36			$28.71	$1.73	$10.34	$0.62			
-Weed Sprayer	0.36			$0.84	$4.39	$0.30	$1.58			
-Total Herbicide			10.87			$10.87	$0.00			
-Total labor	0.54	$18.38				$9.93	$0.00			
Fertilizer								$108.57	$0.61	
-60 HP Used Tractor for Nitrogen application	0.3	$14.48		$28.73	$1.73	$12.96	$0.52			
-Leased Spreader	0.3			$1.00	$0.00	$0.30	$0.00			
-60 HP Used Tractor for Potassium application	0.05	$14.48		$28.73	$1.73	$2.16	$0.09			
-Leased Spreader	0.05			$1.00	$0.00	$0.05	$0.00			
-Fertilizer			$83.70			$83.70	$0.00			
-Lime (2 Ton/Acre @ Each 5th Year)			$9.40			$9.40	$0.00			
Bee Rental (1 Hive/3 Acres)			$18.15					$18.15	$0.00	
Pest Management Service			$38.50					$38.50	$0.00	
Pickup (40 miles/Acre @ 60 cents/Mile)				$20.00	$4.00			$20.00	$4.00	
TOTALOPERATING COSTS								$639.14	$49.33	

Table 3a (cont).

Northwest Mid-sized growers Cash and Labor Costs per acre Based on average saleable yield over its bearing lifetime of 9,000 lbs/acre (85 lbs/tree during peak bearing years)										
	Time	**Labor**	**Materials**	**Equipment**		**Total**		**Total**		**Your Farm**
Operation	*(Hrs/A)	Cash ($/hour)	Cash ($/Acre)	Cash ($/Hour)	Non-cash ($/Hour)	Cash ($/Acre)	Non-cash ($/Acre)	Cash ($/Acre)	Non-cash ($/Acre)	
Harvest										
-Double Incline Shaker	2	$28.96		$51.23	$23.63	$160.38	$47.26			
-75 HP Tractor/Forklift	2	$14.48		$18.76	$9.71	$66.48	$19.42			
-60 HP used Tractor/Forklift	2	$14.48		$28.73	$1.73	$86.42	$3.46			
-Skimmer (or Miscellaneous Labor)	2	$10.58				$21.16	$0.00			
-Shipping (.016 cent/pound*average yield)						$144.00	$0.00			
-Cooling Pad Operation ($.006/lb*Avg Yield)						$54.00	$0.00			
-Tart Cherry Assessment ($.005/lb*Avg Yield)						$45.00	$0.00			
-Ethryl Application			$4.99			$4.99	$0.00			
TOTAL HARVEST COSTS								$582.43	$70.14	
Management and Labor Supervision	8	$28.83				$230.64	$0.00			
Interest on operating capital @ 8%						$41.81	$0.00			
Property Taxes						$30.00	$0.00			
TOTAL MANAGEMENT, INTEREST, AND TAXES								$302.45	$0.00	
PRODUCTION COSTS/ACRE								$1,524.07	$119.47	
TOTAL CASH AND NON-CASH COSTS /ACRE								**$1643.49**		

Table 3b. Northwest Large Scale Growers

Northwest Large-scale growers Cash and Labor Costs per acre Based on average saleable yield over its bearing lifetime of 9.000 lbs/acre (85 lbs/tree during peak bearing years)										
	Time	**Labor**	**Materials**	**Equipment**		**Total**		**Total**		**Your Farm**
Operation	*(Hrs/A)	Cash ($/hour)	Cash ($/Acre)	Cash ($/Hour)	Non-cash ($/Hour)	Cash ($/Acre)	Non-cash ($/Acre)	Cash ($/Acre)	Non-cash ($/Acre)	
Pruning, tipping, and brush disposal								$132.25	$18.34	
-Pruning-Chain Saw	6	$12.25		$0.30		$75.30	$0.00			
-Brush Disposal-85 HP Tractor	0.6	$26.49		$20.39	$9.88	$28.13	$5.93			
-Flail Chopper	0.6			$4.37	$4.84	$2.62	$2.90			
-Summer Tipping-85 HP Tractor	0.5	$26.49		$20.39	$9.88	$23.44	$4.94			
-Summer Tipping-Sickle Bar	0.5			$5.51	$9.13	$2.76	$4.57			
Mowing								$8.94	$7.04	
-85 HP Tractor	0.23	$14.09		$20.39	$9.88	$7.93	$2.27			
-Rotary Mower	0.23			$4.37	$20.72	$1.01	$4.77			
Crop Protection								$328.73	$31.85	
-85 HP Tractor	0.98			$20.39	$9.88	$19.98	$9.68			
-Orchard Sprayer	0.98			$9.90	$22.62	$9.70	$22.17			
-Total Insecticide			$58.30			$58.30	$0.00			
-Total Fungicide			$187.02			$187.02	$0.00			
-Total Plant Growth Regultor			$15.85			$15.85	$0.00			
-Total Spray Labor	1.43	$26.49				$37.88	$0.00			
Borer Control								$1.87	$0.98	
-85 HP Tractor	0.03			$20.39	$9.88	$0.61	$0.30			
-Orchard Sprayer	0.03			$9.90	$22.62	$0.30	$0.68			
-Labor	0.04	$12.25	$0.47			$0.96	$0.00			
Herbicide								$25.87	$1.80	
-60 HP Used Tractor	0.24			$20.81	$2.03	$4.99	$0.49			
-Weed Sprayer	0.24			$0.84	$5.47	$0.20	$1.31			
-Total Herbicide			10.87			$10.87	$0.00			
-Total labor	0.37	$26.49				$9.80	$0.00			
Fertilizer								$109.96	$1.53	
-60 HP Used Tractor for Nitrogen Application	0.3	$26.49		$20.81	$2.03	$14.19	$0.61			
-Spin Spreader	0.3			$0.88	$2.35	$0.26	$0.71			
-60 HP Used Tractor for Potassium Application	0.05	$26.49		$20.81	$2.03	$2.37	$0.10			
-Spin Spreader	0.05			$0.88	$2.35	$0.04	$0.12			
-Fertilizer			$83.70			$83.70	$0.00			
-Lime (2 Ton/Acre @ Each 5th Year)			$9.40			$9.40	$0.00			
Bee Rental (1 Hive/3 Acres)			$18.15					$18.15	$0.00	
Pest Management Service			$27.50					$27.50	$0.00	
Pickup **(40 miles/Acre @ 60 cents/Mile)**				$20.00	$4.00			$20.00	$4.00	
TOTAL OPERATING COSTS								$673.26	$65.53	

Table 3b (cont)

Northwest Large-scale growers Cash and Labor Costs per acre Based on average saleable yield over its bearing lifetime of 9,000 lbs/acre (85 lbs/tree during peak bearing years)										
	Time	**Labor**	**Materials**	**Equipment**		**Total**		**Total**		**Your Farm**
Operation	*(Hrs/A)	Cash ($/hour)	Cash ($/Acre)	Cash ($/Hour)	Non-cash ($/Hour)	Cash ($/Acre)	Non-cash ($/Acre)	Cash ($/Acre)	Non-cash ($/Acre)	
Harvest										
-Double Incline Shaker	1.8	$40.58		$39.93	$34.10	$144.92	$61.38			
-85 HP Tractor/Forklift	1.8	$14.09		$20.39	$9.88	$62.06	$17.78			
-60 HP used Tractor/Forklift	1.8	$14.09		$20.81	$2.03	$62.82	$3.65			
-Skimmer (or Miscellaneous Labor)	1.8	$12.25				$22.05	$0.00			
-Shipping (.016 cent/pound*average yield)						$142.00	$0.00			
-Cooling Pad Operation ($.006/lb*Avg Yield)						$53.25	$0.00			
-Tart Cherry Assessment ($.005/lb*Avg Yield)						$44.38	$0.00			
-Ethryl Application			$4.60			$4.60	$0.00			
TOTAL HARVEST COSTS								$536.08	$82.82	
Management and Labor Supervision	6	$25.00				$150.00	$0.00			
Interest on operating capital @ 8%						$43.05	$0.00			
Property Taxes						$30.00	$0.00			
TOTAL MANAGEMENT, INTEREST, AND TAXES								$223.05	$0.00	
TOTAL PRODUCTION COSTS								$1,432.39	$148.35	
TOTAL CASH AND NON-CASH COSTS /ACRE								**$1,580.74**		

Table 3c. Southwest Growers

Southwest Growers Cash and Labor Costs per acre Based on average saleable yield over its bearing lifetime of 5,600 lbs/acre (54 lbs /tree average yield during peak bearing years)										**Your Farm**
	Time	**Labor**	**Materials**	**Equipment**		**Total**		**Total**		
Operation	*(Hrs/A)	Cash ($/hour)	Cash ($/Acre)	Cash ($/Hour)	Non-cash ($/Hour)	Cash ($/Acre)	Non-cash ($/Acre)	Cash ($/Acre)	Non-cash ($/Acre)	
Pruning								$159.86	$31.94	
-Pruning-Tower and Saw	6	$11.75		$9.51	$2.56	$127.56	$15.36			
-Brush Disposal-60 HP Tractor	1	$11.75		$15.11	$5.89	$26.86	$5.89			
-Brush Rake	1			$0.28	$1.86	$0.28	$1.86			
-Summer Tipping-85 HP Tractor	0.133	$17.92		$18.07	$19.57	$4.79	$2.60			
-Summer Tipping-Sickle Bar	0.133			$2.77	$46.83	$0.37	$6.23			
Disking								$44.22	$9.12	
-60 HP Tractor	1.32	$17.92		$15.11	$5.89	$43.60	$7.77			
-10 FT Disc	1.32			$0.47	$1.02	$0.62	$1.35			
Crop Protection								$235.54	$24.39	
-85 HP Tractor	0.806			$18.07	$19.57	$14.56	$15.77			
-Orchard Sprayer	0.806			$2.23	$10.69	$1.80	$8.62			
-Total Insecticide			$40.91			$40.91	$0.00			
-Total Fungicide			$137.74			$137.74	$0.00			
-Total Plant Growth Regulators			$18.92			$18.92	$0.00			
-Total Spray Labor	1.206	$17.92				$21.61	$0.00			
Borer Control								$2.07	$0.91	
-85 HP Tractor	0.03			$18.07	$19.57	$0.54	$0.59			
-Orchard Sprayer	0.03			$2.23	$10.69	$0.07	$0.32			
-Labor	0.124	$11.75				$1.46	$0.00			
Herbicide								$14.33	$4.14	
-60 HP Tractor	0.28			$15.11	$5.89	$4.23	$1.65			
-Weed Sprayer	0.28			$0.86	$8.91	$0.24	$2.49			
-Total Herbicide			4.92			$4.92	$0.00			
-Total labor	0.42	$11.75				$4.94	$0.00			
Fertilizer								$98.54	$1.50	
-60 HP Used Tractor for Nitrogen Application	0.1	$11.75		$31.10	$2.71	$4.29	$0.27			
-Spin Spreader	0.1			$0.74	$7.30	$0.07	$0.73			
-60 HP Used Tractor for Potassium Application	0.05	$11.75		$31.10	$2.71	$2.14	$0.14			
-Spin Spreader	0.05			$0.74	$7.30	$0.04	$0.37			
-Fertilizer			$80.25			$80.25	$0.00			
-Lime (2 Ton/Acre @ Each 4th Year)			$11.75			$11.75	$0.00			

Bee Rental (1 Hive/2 Acres)	$22.50				$22.50	$0.00
Pest Management Service	$0.00				$0.00	$0.00
Pickup **(40 miles/Acre @ 60 cents/Mile)**		$20.00	$4.00		$20.00	$4.00
TOTAL OPERATING COSTS					$597.05	$76.01

Table 3c (cont)

Southwest Growers Cash and Labor Costs per acre

Based on average saleable yield over its bearing lifetime of 5,600 lbs/acre (54 lbs /acre average yield during peak bearing years)

	Time	**Labor**	**Materials**	**Equipment**		**Total**		**Total**		**Your Farm**
Operation	*(Hrs/A)	Cash ($/hour)	Cash ($/Acre)	Cash ($/Hour)	Non-cash ($/Hour)	Cash ($/Acre)	Non-cash ($/Acre)	Cash ($/Acre)	Non-cash ($/Acre)	
Harvest										
-Double Incline Shaker	2	$35.84		$86.19	$79.07	$244.06	$158.14			
-60 HP Tractor/Forklift	2	$11.75		$15.11	$5.89	$53.72	$11.78			
-60 HP used Tractor/Forklift	2	$11.75		$31.10	$2.71	$85.70	$5.42			
-Skimmer (or Miscellaneous Labor)	2	$8.81				$17.62	$0.00			
-Shipping (.016 cent/pound*Avg Yield)						$89.60	$0.00			
-Cooling Pad Operation ($.006/lb*Avg Yield)						$33.60	$0.00			
-Tart Cherry Assessment ($.005/lb*Avg Yield)						$28.00	$0.00			
-Ethryl Application			$4.50			$4.50	$0.00			
TOTAL HARVEST COSTS								$556.80	$175.34	
Management and Labor Supervision	3	$28.83				$86.49	$0.00			
Interest on operating capital @ 8%						$39.86	$0.00			
Property Taxes						$30.00	$0.00			
TOTAL MANAGEMENT, INTEREST, AND TAXES								$156.35	$0.00	
TOTAL PRODUCTION COSTS/ACRE								$1,310.20	$251.35	
TOTAL CASH AND NON-CASH COSTS /ACRE								**$1,561.55**		

Table 3d. West Central Growers

West Central Growers Cash and Labor Costs per acre Based on average saleable yield over its bearing lifetime of 6,300 lbs/acre (60 lbs /acre average yield during peak bearing years)										**Your Farm**
	Time	**Labor**	**Materials**	**Equipment**		**Total**		**Total**		
Operation	*(Hrs/A)	Cash ($/hour)	Cash ($/Acre)	Cash ($/Hour)	Non-cash ($/Hour)	Cash ($/Acre)	Non-cash ($/Acre)	Cash ($/Acre)	Non-cash ($/Acre)	
Pruning								$141.70	$25.40	
-Pruning-Tower and Saw	5.5	$12.55		$9.25	$1.68	$119.90	$9.24			
-Brush Disposal-85 HP Tractor	0.5	$12.55		$18.93	$9.04	$15.74	$4.52			
-Flail Chopper	0.5			$3.25	$9.30	$1.63	$4.65			
-Summer Tipping-85 HP Tractor	0.1	$22.61		$18.93	$9.04	$4.15	$0.90			
-Summer Tipping-Sickle Bar	0.1			$2.81	$60.88	$0.28	$6.09			
Mowing								$9.90	$5.08	
-85 HP Tractor	0.27	$12.55		$18.93	$9.04	$8.50	$2.44			
-Rotary Mower	0.27			$5.18	$9.77	$1.40	$2.64			
Crop Protection								$304.18	$14.81	
-85 HP Tractor	0.744			$18.93	$9.04	$14.08	$6.73			
-Orchard Sprayer	0.744			$2.23	$10.87	$1.66	$8.09			
-Total Insecticide			$58.30			$58.30	$0.00			
-Total Fungicide			$187.02			$187.02	$0.00			
-Total Plant Growth Regulators			$15.85			$15.85	$0.00			
-Total Spray Labor	1.206	$22.61				$27.27	$0.00			
Borer Control								$4.35	$1.23	
-85 HP Tractor	0.062			$18.93	$9.04	$1.17	$0.56			
-Orchard Sprayer (hand held)	0.062			$2.23	$10.87	$0.14	$0.67			
-Labor	0.093	$12.55	$1.87			$3.04	$0.00			
Herbicide								$22.39	$3.92	
-60 HP Tractor	0.24			$13.23	$9.03	$3.18	$2.17			
-Weed Sprayer	0.24			$0.86	$7.30	$0.21	$1.75			
-Total Herbicide			10.87			$10.87	$0.00			
-Total labor	0.36	$22.61				$8.14	$0.00			
Fertilizer								$109.25	$1.68	
-60 HP Used Tractor for Nitrogen Application	0.175	$12.55		$11.83	$2.05	$4.27	$0.36			
-Spin Spreader	0.175			$0.79	$3.80	$0.14	$0.67			
-60 HP Used Tractor for Potassium Application	0.113	$12.55		$11.83	$2.05	$2.75	$0.23			
-Spin Spreader	0.113			$0.79	$3.80	$0.09	$0.43			
-Fertilizer			$90.25			$90.25	$0.00			
-Lime (2 Ton/Acre @ Each 4th Year)			$11.75			$11.75	$0.00			
Bee Rental (1 Hive/3 Acres)			$14.85					$14.85	$0.00	
Pest Management Service			$30.00					$30.00	$0.00	

Pickup-Half Ton (40 miles/Acre @ 60 cents/Mile)	$20.00	$4.00		$20.00	$4.00	
TOTAL OPERATING COSTS				$656.62	$56.13	

Table 3d (cont)

West Central Growers Cash and Labor Costs per acre Based on average saleable yield over its bearing lifetime of 6,300 lbs/per acre (60 lbs /acre average yield during peak bearing years)										**Your Farm**
	Time	**Labor**	**Materials**	**Equipment**		**Total**		**Total**		
Operation	*(Hrs/A)	Cash ($/hour)	Cash ($/Acre)	Cash ($/Hour)	Non-cash ($/Hour)	Cash ($/Acre)	Non-cash ($/Acre)	Cash ($/Acre)	Non-cash ($/Acre)	
Harvest										
-Used One Man Shaker	2	$22.61		$55.09	$55.83	$155.40	$111.66			
-85 HP Tractor/Forklift	2	$12.55		$18.93	$9.04	$62.96	$18.08			
-60 HP used Tractor/Forklift	2	$12.55		$11.83	$2.05	$48.76	$4.10			
-Skimmer (or Miscellaneous Labor)	2	$9.86				$19.72	$0.00			
-Shipping (.016 cent/pound*Avg Yield)						$100.80	$0.00			
-Cooling Pad Operation ($.006/lb*Avg Yield)						$37.80	$0.00			
-Tart Cherry Assessment ($.005/lb*Avg Yield)						$31.50	$0.00			
-Ethryl Application			$4.50			$4.50	$0.00			
TOTAL HARVEST COSTS								$461.44	$133.84	
Management and Labor Supervision	3.6	$28.83				$103.79	$0.00			
Interest on operating capital @ 8%						$41.17	$0.00			
Property Taxes						$30.00	$0.00			
TOTAL MANAGEMENT, INTEREST, AND TAXES								$174.96	$0.00	
TOTAL PRODUCTION COSTS/ACRE								$1,293.02	$189.97	
TOTAL CASH AND NON-CASH COSTS /ACRE								**$1,657.95**		

Appendix

Equipment Costs

Factors considered in the following computations include initial cost, salvage value, years of useful life, annual usage, repair costs, insurance costs, and costs associated with operation of the equipment, such as fuel and oil. The initial cost, salvage value and interest rate are used to calculate a capital recovery charge (depreciation + interest on average investment).

Annual and hourly equipment costs were calculated in Table 4. Tables 4a and 4b describe costs for mid-sizeder sized Northwest growers. Tables 4c and 4d describe costs for larger sized Northwest growers. Tables 4e and 4f and 4g and 4h describe the describe costs for Southwest and West Central Growers, respectively

Fertilizer Costs

Fertilizer costs are presented in Tables 5a, 5b, and 5c for the Northwest, Southwest, and West Central growing region, respectively.

Table 4. Annual and Hourly Equipment Costs

Table 4a. Annual Costs for Mid-sized Scale Northwest Growers

Annual Equipment Costs for Mid-sizeder Scale Northwest Michigan Growers

Description	Yr	Purchase Price	Yrs Life	Salvage Value	PV of Salvage in today's dollars	Interest Rate	Annual Machinery Cost	Insurance	Taxes	Total
75 HP 2WD Tractor	2007	$45,765	8.0	$6,865	$3,709	8%	$7,318	$114	$0	$7,433
60 HP 2WD Used Tractor	1999	$8,306	9.0	$1,246	$623	8%	$1,130	$21	$0	$1,151
Shaker	2007	$84,750	12.5	$30,000	$11,464	8%	$7,089	$212	$0	$7,301
**Orch.Sprayer 500 G	2007	$22,600	12.0	$7,049	$2,799	8%	$2,064	$57	$0	$2,120
**Weed Sprayer 300 G	2007	$4,520	12.0	$1,410	$560	8%	$413	$11	$0	$424
Rotary Mower	2007	$3,277	15.0	$808	$255	8%	$288	$8	$0	$297
Flail Mower	2007	$10,848	10.0	$3,212	$1,488	8%	$1,138	$27	$0	$1,165
TOTAL		$180,066					$19,440			$19,890

Table 4b. Hourly Costs for Mid-sized Scale Northwest Growers

Hourly Equipment Costs for Mid-sizeder-Scale Growers--NW Region

Description	Yr	*Total Hours Used	Hours for Tart Cherries	Capital Recovery	Insurance	Taxes	**Repairs	*** Fuel & Lube	Total. Oper.	Total Costs/hr
75 HP 2WD Tractor	2007	754	377	$9.71	$0.15	$0.00	4.64	$13.96	$18.61	$28.46
60 HP 2WD Used tractor	1999	654	327	$1.73	$0.03	$0.00	$17.53	$11.17	$28.70	$30.46
Shaker	2007	300	200	$23.63	$0.71	$0.00	$22.60	$27.92	$50.52	$74.86
Orch.Sprayer 500 G	2007	166	83	$12.43	$0.34	$0.00	$2.71	$0.00	$2.71	$15.48
Weed Sprayer 100 G	2007	94	47	$4.39	$0.12	$0.00	$0.72	$0.00	$0.72	$5.23
Rotary Mower	2007	90	45	$3.21	$0.09	$0.00	$0.61	$0.00	$0.61	$3.91
Flail Mower	2007	166	83	$6.86	$0.16	$0.00	$3.30	$0.00	$3.30	$10.32
Total										$168.72

* assumes that other half of the farm uses the equipment equally, except for the shaker, which is used on 75% of total acreage.

**see averages generated in Misc. Tables, formulas from ASAE, tractor functions rescaled to 6000 hours

*** $4.25/gal for diesel

Table 4c. Annual Costs for Large Scale Northwest Growers

Annual Equipment Costs for Larger-Scale Northwest Michigan Growers

Description	Yr	Purchase Price	Yrs Life	Salvage Value	PV of Salvage in today's dollars	Interest Rate	Annual Machinery Cost	Insurance	Taxes	Total
85 HP 2WD Tractor	2007	$46,895	7.0	$7,034	$4,104	8%	$8,219	$117	$0	$8,336
60 HP 2WD Tractor	2007	$32,770	6.0	$4,916	$3,098	8%	$6,419	$82	$0	$6,501
60 HP 2WD Used Tractor	2001	$8,306	6.0	$1,246	$785	8%	$1,627	$21	$0	$1,648
Shaker	2007	$169,500	12.5	$30,000	$11,464	8%	$20,462	$424	$0	$20,886
Orch.Sprayer 500 G	2007	$56,500	12.5	$17,126	$6,544	8%	$6,468	$141	$0	$6,609
Weed Sprayer 100 G	2007	$4,520	12.0	$1,410	$560	8%	$525	$11	$0	$537
Rotary mower (batwing)	2007	$18,080	15.0	$4,457	$1,405	8%	$1,948	$45	$0	$1,993
Flail Mower	2007	$9,040	10.0	$2,677	$1,240	8%	$1,162	$23	$0	$1,185
Spin/Spreader -3PT	2007	$2,825	12.0	$881	$350	8%	$328	$7	$0	$335
Sickle bar	2007	$16,950	15.0	$4,179	$1,317	8%	$1,826	$42	$0	$1,869
TOTAL		$365,386					$48,985			$49,899

Table 4d. Hourly Costs for Large Scale Northwest Growers

Hourly Equipment Costs for Larger-Scale Growers--NW Region

Description	Yr	*Total Hours Used	Hours for Tart Cherries	Capital Recovery	Insurance	Taxes	**Repairs	*** Fuel & Lube	Total. Oper.	Total Costs/hr
85 HP 2WD Tractor	2007	832	416	$9.88	$0.14	$0.00	$4.43	$15.82	$20.25	$30.27
60 HP 2WD Tractor	2007	1000	500	$6.42	$0.08	$0.00	$3.45	$11.17	$14.62	$21.12
60 HP 2WD Used Tractor	2001	800	400	$2.03	$0.03	$0.00	$9.62	$11.17	$20.79	$22.84
Shaker	2007	600	400	$34.10	$0.71	$0.00	$11.30	$27.92	$39.22	$74.03
Orch.Sprayer 500 G	2007	286	143	$22.62	$0.49	$0.00	$9.40	$0.00	$9.40	$32.51
Weed Sprayer 100 G	2007	96	48	$5.47	$0.12	$0.00	$0.72	$0.00	$0.72	$6.31
Rotary mower	2007	94	47	$20.72	$0.48	$0.00	$3.54	$0.00	$3.54	$24.74
Flail Mower	2007	240	120	$4.84	$0.09	$0.00	$4.27	$0.00	$4.27	$9.21
Spin/Spreader -3PT	2007	140	70	$2.35	$0.05	$0.00	$0.82	$0.00	$0.82	$3.22
Sickle Bar	2007	200	100	$9.13	$0.21	$0.00	$5.30	$0.00	$5.30	$14.64
Total										$238.91

* assumes that other half of the farm uses the equipment equally, except for the shaker, which is used on 75% of total acreage.

**see averages generated in Misc. Tables, formulas from ASAE, tractor functions rescaled to 6000 hours

*** $4.25/gal for diesel

Table 4e. Annual Costs for Southwest Growers

Annual Equipment Costs for Southwest Michigan Growers

Description	Yr	Purchase Price	Yrs Life	Salvage Value	PV of Salvage in today's dollars	Interest Rate	Annual Machinery Cost	Insurance	Taxes	Total
85 HP 2WD Tractor	2007	$46,895	12.0	$7,034	$2,793	8%	$5,852	$117	$0	$5,969
60 HP 2WD Tractor	2007	$32,770	5.0	$4,916	$3,345	8%	$7,370	$82	$0	$7,452
60 HP 2WD Used Tractor	2000	$8,306	6.0	$1,246	$785	8%	$1,627	$21	$0	$1,648
Shaker	2007	$84,750	12.5	$30,000	$11,464	8%	$9,489	$212	$0	$9,701
Orch.Sprayer 500 G	2007	$22,600	12.5	$6,850	$2,618	8%	$2,587	$57	$0	$2,644
Weed Sprayer 100 G	2007	$4,520	12.0	$1,410	$560	8%	$525	$11	$0	$537
Spin/Spreader -3PT	2007	$2,825	12.0	$881	$350	8%	$328	$7	$0	$335
Sickle bar	2007	$16,950	15.0	$4,179	$1,317	8%	$1,826	$42	$0	$1,869
Pruning Tower & Hyd. Saw	2007	$23,165	14.0	$1,000	$340	8%	$2,769	$58	$0	$2,826
Brush rake	2007	$3,051	25.0	$459.31	$67	8%	$280	$8	$0	$287
10 ft. Disc plow	2007	$2,260	5.0	$940.31	$640	8%	$406	$6	$0	$411
TOTAL		$248,092					$33,059	$620		$33,679

Table 4f. Hourly Costs for Southwest Growers

Hourly Equipment Costs for Southwest Region

Description	Yr	*Total Hours Used	Hours for Tart Cherries	Capital Recovery	Insurance	Taxes	**Repairs	*** Fuel & Lube	Total. Oper.	Total Costs/hr
85 HP 2WD Tractor	2007	299	59.8	$19.57	$0.39	$0.00	$1.85	$15.82	$17.68	$30.42
60 HP 2WD Tractor	2007	1251	250.2	$5.89	$0.07	$0.00	$3.88	$11.17	$15.04	$15.90
60 HP 2WD Used Tractor	2000	600	120	$2.71	$0.03	$0.00	$19.90	$11.17	$31.07	$28.72
Shaker	2007	120	120	$79.07	$1.77	$0.00	$56.50	$27.92	$84.42	$152.52
Orch.Sprayer 500 G	2007	242	48.4	$10.69	$0.23	$0.00	$2.00	$0.00	$2.00	$12.92
Weed Sprayer 100 G	2007	59	11.8	$8.91	$0.19	$0.00	$0.67	$0.00	$0.67	$9.76
Spin/Spreader -3PT	2007	45	9	$7.30	$0.16	$0.00	$0.59	$0.00	$0.59	$8.04
Sickle Bar	2007	39	7.8	$46.83	$1.09	$0.00	$1.68	$0.00	$1.68	$49.60
Pruning Tower & Hyd. Saw	2007	1080	360	$2.56	$0.05	$0.00	$0.96	$8.50	$9.46	$6.72
Brush rake	2007	150	30	$1.86	$0.05	$0.00	$0.23	$0.00	$0.23	$2.14
10 ft. disc plow	2007	396	79.2	$1.02	$0.01	$0.00	$0.45	$0.00	$0.45	$1.49
Total										$327.22

* assumes that other half of the farm uses the equipment equally, except for the shaker, which is used on 75% of total acreage.

**see averages generated in Misc. Tables, formulas from ASAE, tractor functions rescaled to 6000 hours

*** $4.25/gal for diesel

Table 4g. Annual Costs for West Central Growers

Annual Equipment Costs for West Central Michigan Growers

Description	Yr	Purchase Price	Yrs Life	Salvage Value	PV of Salvage in today's dollars	Interest Rate	Annual Machinery Cost	Insurance	Taxes	Total
85 HP 2WD Tractor	2007	$46,895	7.0	$7,034	$4,104	8%	$8,219	$117	$0	$8,336
60 HP 2WD Tractor	2007	$32,770	12.0	$4,916	$1,952	8%	$4,089	$82	$0	$4,171
60 HP 2WD Used Tractor	2000	$8,306	9.0	$1,246	$623	8%	$1,230	$21	$0	$1,251
Shaker	2007	$84,750	12.5	$30,000	$11,464	8%	$9,489	$212	$0	$9,701
**Orch.Sprayer 500 G	2007	$22,600	12.0	$7,049	$2,799	8%	$2,627	$57	$0	$2,684
**Weed Sprayer 300 G	2007	$4,520	12.0	$1,410	$560	8%	$525	$11	$0	$537
Rotary Mower	2007	$14,690	15.0	$3,621	$1,142	8%	$1,583	$37	$0	$1,620
Flail Mower	2007	$10,848	10.0	$3,212	$1,488	8%	$1,395	$27	$0	$1,422
Sickle bar	2007	16,950	15.0	$4,179	$1,317	8%	$1,826	$42	$0	$1,869
Spin/Spreader -3PT	2007	$2,825	12.0	$881	$350	8%	$328	$7	$0	$335
Pruning Tower & Hyd. Saw	2007	$23,165	14.0	$1,000	$340	8%	$2,769	$58	$0	$2,826
TOTAL		$268,319					$34,081	$671		$34,752

Table 4h. Hourly Costs for West Central Growers

Hourly Equipment Costs for West Central Region

Description	Yr	*Total Hours Used	Hours for Tart Cherries	Capital Recovery	Insurance	Taxes	**Repairs	*** Fuel & Lube	Total. Oper.	Total Costs/hr
85 HP 2WD Tractor	2007	909	227	$9.04	$0.13	$0.00	$4.84	$13.96	$18.80	$21.60
60 HP 2WD Tractor	2007	453	113	$9.03	$0.18	$0.00	$1.97	$11.17	$13.14	$17.25
60 HP 2WD Used tractor	2000	600	150	$2.05	$0.03	$0.00	$0.62	$11.17	$11.79	$8.78
Shaker	2007	170	150	$55.83	$1.25	$0.00	$39.88	$13.96	$53.84	$104.55
Orch.Sprayer 500 G	2007	242	60	$10.87	$0.23	$0.00	$2.00	$0.00	$2.00	$13.10
Weed Sprayer 100 G	2007	72	18	$7.30	$0.16	$0.00	$0.70	$0.00	$0.70	$8.16
Rotary Mower	2007	162	41	$9.77	$0.23	$0.00	$4.95	$0.00	$4.95	$14.95
Flail Mower	2007	150	38	$9.30	$0.18	$0.00	$3.07	$0.00	$3.07	$12.55
Sickle Bar	2007	30	8	$60.88	$1.41	$0.00	$1.40	$0.00	$1.40	$63.69
Spin/Spreader -3PT	2007	86	22	$3.80	$0.08	$0.00	$0.71	$0.00	$0.71	$4.59
Pruning Tower & Hyd. Saw	2007	1652	413	$1.68	$0.04	$0.00	$0.71	$8.50	$9.21	$5.56
Total										$284.29

* assumes that other half of the farm uses the equipment equally, except for the shaker, which is used on 75% of total acreage.

**see averages generated in Misc. Tables, formulas from ASAE, tractor functions rescaled to 6000 hours

*** $4.25/gal for diesel

Table 5. Fertilizer Costs

Table 5a. Northwest Fertilizer Costs

	Northwest - Large and Mid-sized producers			
				Cost/Acre
Total Fungicide				$187.02
Total Insecticide				$58.30
Total Plant growth regulator				$15.85
Total Herbicide				$10.87
Fertilizer	**Quantity per acre**	**Unit**	**Cost/Unit**	**Cost/Acre**
Foliar fertilizer:				
0-0-60 (potash)	0.05	ton	$400	$20.00
46-0-0 (urea)	0.098	ton	$650	$63.70
Total Fertilizer				$83.70
Bee Rental	0.33	hive	$55	$18.15
Total				**$373.89**

Table 5b. Southwest Fertilizer Costs

	Southwest			
				Cost/Acre
Total Fungicide				$137.74
Total Insecticide				$40.91
Total Plant growth regulator				$18.92
Total Herbicide				$4.92
Fertilizer	**Quantity per acre**	**Unit**	**Cost/Unit**	**Cost/Acre**
Foliar fertilizer:				
0-0-60 (potash)	0.042	ton	$400	$16.67
46-0-0 (urea)	0.098	ton	$650	$63.59
Total Fertilizer				$80.25
Bee Rental	0.5	hive	$45	$22.50
Total				**$305.24**

Table 5c. West Central Fertilizer Costs

	West Central			
				Cost/Acre
Total Fungicide				$187.02
Total Insecticide				$58.30
Total Plant growth regulator				$15.85
Total Herbicide				$10.87
Fertilizer	**Quantity per acre**	**Unit**	**Cost/Unit**	**Cost/Acre**
Foliar fertilizer:				
0-0-60 (potash)	0.067	ton	$400	$26.67
46-0-0 (urea)	0.098	ton	$650	$63.59
Total Fertilizer				$90.25
Bee Rental	0.33	hives	$45	$14.85
Total				**$377.14**