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Cost of Producing Tart Cherries in Northwestern Michigan



By James Nugent, Glenn Kole, Gary Thornton, and James Bardenhagen¹

This cost evaluation of tart cherry production in northwestern Michigan is a projection of costs developed through focus group discussions with cherry growers from Antrim, Leelanau and Grand Traverse counties. In the discussions, growers described growing and harvesting practices of representative cherry growers in the area. They also agreed on the size of cherry acreage, the equipment and the cultural practices generally used by a grower.

These figures cannot necessarily reflect the average cost of tart cherry production for each grower in the state. Costs vary considerably by area and from farm to farm.

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 costs for a particular operation. Where costs cannot be determined, you may wish to adjust and substitute the study data.

The assembled data assume that equipment and labor are available for a hypothetical farm of 200 acres of diversified tree fruit, including 100 acres of tart cherries. The data in Table 1 are presented for 10 acres of tart cherries, however, to make it easier for you to visualize many of the resource inputs.

Labor Costs

The full-time labor classification includes the working time of the operator and regular hired help devoted to cherries. Operator labor is not considered a cash expense. But to allow for differences in the proportion of work performed by regular hired help or by the operator, both have been included as cash expenses. As a result, producers who do a major portion of the work may have a lower cash labor cost than the figures indicate.

¹ MSU Extension district horticulture and marketing agent, district farm management agent, district fruit IPM agent and Leelanau County Extension director, respectively.

Several rates were combined to determine a 23 percent labor fringe, i.e. 7.65 percent for FICA, 8 percent for workers compensation and 7.35 percent for a combination of housing, health insurance, unemployment, retirement plans, etc.

Equipment Costs

Major factors considered in the computation of equipment costs are depreciation (based on years of life and annual usage), initial cost, salvage value, years of life, annual usage, repair costs, insurance, interest and operating expenses such as fuel and oil. The operating costs per hour, based on direct use of equipment, are given in Table 1, pages 4-5.

Variable Costs

Variable costs are those that change directly with increases or decreases in the acreage of tart cherries. Examples of such costs are spray material, fertilizer, hired labor and machinery operating costs.

Variable costs incurred in cherry production are categorized by labor, machinery and materials in Table 1. Included is a breakdown of hours for labor and machinery by operation as well as cost of materials. If your costs are substantially higher than those shown, analyze those components closely to see if you can reduce them. A high cost for a particular component may be justified if it contributes to sufficiently higher yield or improved quality.

Costs incurred in harvesting an acre with 7,000 lbs of cherries are shown in Table 2. The influence of yield on harvest costs is shown in Table 3. Harvest costs per acre are adjusted down at low yield to reflect greater harvest speed when handling less fruit and are adjusted higher at high yields. The costs include machinery depreciation, repairs, operating costs and labor. At 7,000 pounds per acre, harvest, handling and assessment costs were 8.3 cents per pound.

Overhead Costs

The overhead or fixed costs of cherry production (Table 4) include interest on orchard investment, orchard depreciation and taxes. The details of orchard establishment costs are shown in Tables 6 and 7.

Fixed costs on machinery, including depreciation, interest on investment, insurance and housing, are included with variable costs in the equipment section of Table 1. Interest on land and growing and establishment costs were charged at 6.5 percent. Fixed costs vary more from farm to farm than do the variable costs shown in Table 1. Such costs are for land acquisition and orchard establishment. If a grower establishes an orchard, current establishment costs illustrated in Tables 7 and 8 are more appropriate to use.

You should evaluate your farm situation and decide whether to consider fixed costs as part of the total cost for decision-making purposes. For example, orchard overhead is a fixed cost if you own the orchard outright but a variable cost if you rent.

Production Costs

Yield per acre is very important in determining production costs per pound (Table 6). In computing per pound costs, it was assumed that pre-harvest costs per acre, such as spraying, pruning, cultivating, etc., do not vary greatly, regardless of the yield. Harvest rates were adjusted based on yield in Table 3

Overhead costs for interest on orchard value and depreciation will vary considerably from farm to farm, depending on when the orchard was planted. These costs include an estimated 2002 establishment cost, so they may overstate actual costs on currently producing orchards. You are encouraged to substitute your land and orchard acquisition or establishment costs in these tables.

Trickle irrigation costs were not included in this analysis. Initial investment in such a system would cost \$500 to \$700 per acre.

Establishment Costs for a New Orchard

All pre-productive establishment costs incurred in years 1-5, including interest, are capitalized in one establishment cost. Individual cash costs will vary widely, depending on the site preparation and the cultural practices needed to establish the orchard. This example does not include the cost of trickle irrigation, which is expensive but should obtain higher economic yields from trees at an earlier age.

The first column of Table 8 summarizes the costs per year shown in Table 7. In the second column, an interest charge of 6.5 percent is calculated on one-half of the current year's growing cost and on the prior years' accumulated cost. The third column shows the interest charge of 6.5% on the land investment of \$5,000 per acre. In Table 4 the final accumulated cost of year 5 is used to calculate the operating year's depreciation of the established cost. If you purchase an orchard, substitute the purchase cost for the establishment cost.

Marketable Yield

In situations where a portion of the crop is abandoned or not harvested for diversion purposes, it is best to calculate costs per pound on the product that was marketed.

Table 2. Harvest, handling and promotion costs per 7,000 lbs/A of tart cherries, northwestern Michigan, 2002.

	Unit	Price	Total	Your farm
Shaking & handling @ \$250/hr	1.75 hrs	\$250/hr	\$438	
Cooling pad operation @ \$.005/lb	7,000 lbs	0.005/lb	35	
Hauling @ \$.01/lb	7,000 lbs	0.01/lb	70	
Total variable harvest cost/A			543	
Total variable harvest cost/lb (at 7,000 lbs/A)			0.078	
Cherry promotion assessment @ \$.005/lb	7,000 lbs	0.005/lb	35	
Total harvest and assessment cost/A			578	
Total harvest and assessment cost/lb (@ 7,000 lb/A)			0.083	

Table 3. Harvest, handling and promotion costs for tart cherries at various yields, northwestern Michigan, 2002.

Harvest Costs/lb									
Yield (lbs)	Harvest			Handling		Promotion	Total harvest, handling & promotion		Your Farm
	Cost/A Adjustment	Cost/A ¹	Cost/lb	Cooling @\$.005/lb	Hauling @\$.01/lb	Assessment @\$.005/lb	Cost /A	Cost /lb	
2,000	-10%	\$394	\$0.197	\$10	\$ 20	\$10	\$434	\$0.217	
4,000	-10%	\$394	\$0.098	\$20	\$ 40	\$20	\$474	\$0.118	
6,000	0	\$438	\$0.073	\$30	\$ 60	\$30	\$558	\$0.093	
7,000	0	\$438	\$0.063	\$35	\$ 70	\$35	\$578	\$0.083	
8,000	0	\$438	\$0.055	\$40	\$ 80	\$40	\$598	\$0.075	
10,000	0	\$438	\$0.044	\$50	\$100	\$50	\$638	\$0.064	
12,000	+10%	\$481	\$0.040	\$60	\$120	\$60	\$721	\$0.060	
14,000	+10%	\$481	\$0.034	\$70	\$140	\$70	\$761	\$0.054	

¹Harvest costs = 1.75 hrs/A x \$250/hr = \$437.50/A at 6,000 to 10,000 lbs/A, with adjustments at low & high yields.

Table 1. Variable growing cost for 10A of

Operation	Labor				Machinery		
	Labor (hrs)	Wage rate	Benefits (23%)	Labor Cost /10A	Equipment	Hours of use	Unit cost
Trimming every 2.5 yr. — avg. cost	80	\$11.00	\$2.53	\$1,082.40	Chain saw & hand tools	80.0	\$0.25
Brush piling	5	8.00	1.84	49.20	Misc. tools	5.0	0.20
Brush removal	4	11.00	2.53	54.12	Tractor (75 hp) Flail chopper	4.0 4.0	12.83 24.00
Fertilizer: nitrogen	1.5	11.00	2.53	20.30	Tractor (60 hp) Fertilizer spreader	1.5 Rent	10.35 8/ton
Fertilizer: potash (annual cost)	1	11.00	2.53	13.53	Tractor (60 hp) Fertilizer spreader	1.0 Rent	10.35 8/ton
Foliar nutrients							
Lime (every third year) — annual cost							
Weed control (2 applications, treating 50% of land)	6	14.00	3.22	103.32	Tractor (60hp) Weed sprayer	6.0 6.0	10.35 10.00
Mowings (3 times)	6	11.00	2.53	81.18	Tractor (60 hp) Rotary mower	6.0 6.0	10.35 12.50
Bee rental							
Summer tipping: sickle bar — custom rate @ \$40/hr.							
Spray program (4.5 sprays)	10	14.00	3.22	172.20	Tractor (75 hp) PTO sprayer	10.0 10.0	12.83 14.00
Ethrel spray	2	14.00	3.22	34.44	Tractor (75 hp) Sprayer	2.0 2.0	12.83 14.00
Borer control (every 4th year) — annual cost	1	11.00	2.53	13.53	Tractor (75 hp) High pressure sprayer	1.0 1.0	12.83 14.00
Mouse baiting (every 4th year) — annual cost	0.4	11.00	2.53	5.41	Tractor (60 hp) Spreader	0.4 0.4	10.35 15.00
Pest management service @ \$25/A							
Management & labor supervision	50	20.00		1,000.00			
Pickup truck operation (miles)					Pickup truck	400 miles	.36/mile
TOTALS: 10A	166.9			\$2,630.00			

tart cherries, northwestern Michigan, 2002.

		<i>Materials</i>		
Machinery Cost/10A	Item	Material Cost/10A	Total Variable Cost	Your Farm
\$20.00			\$1,102.40	
1.00			50.20	
51.32			201.44	
96.00				
15.53	33-0-0 300 lbs	300.00	347.82	
12.00	@ \$200/ton			
10.35	0-0-60 100 lbs	79.00	106.88	
4.00	@ \$158/ton			
	\$16/A	160.00	160.00	
	2 tons/A custom applied			
	@ \$22/ton x 1/3 average	147.00	147.00	
62.10	material cost	175.00	400.42	
60.00	@ \$17.50/treated A/application			
62.10			218.28	
75.00				
	3 hives/10A @ \$40/hive	120.00	120.00	
	4 hrs. custom rate @ \$40/hr	160.00	160.00	
128.30	Insecticides & fungicides	1,455.00	1,895.50	
140.00	@ \$135/A; gibberelin @ \$10.50/A			
25.66	.7 pt Ethrel/A @ \$5.20/pt	36.40	124.50	
28.00				
12.83	Lorsban: 2qt/100 gal	18.00	58.36	
14.00				
4.14	mouse bait @ \$1/A	10.00	25.55	
6.00				
		250.00	250.00	
			1,000.00	
144.00			144.00	
\$972.00		\$2,910.00	\$6,512.00	

Table 4. Overhead cost for growing and harvesting 10A (7,000 lb/A) of bearing tart cherries, northwestern Michigan, 2002.

	Established Orchard	Your farm
Interest on land (\$5,000/A @ 6.5%)	\$3,250	
Property taxes (@\$30/A)	300	
Average interest on orchard establishment cost of \$6,442.50/A @ 6.5% (Table 7)	2,094	
Depreciation of establishment cost (20 yr) (Table 7)	3,221	
Six months interest on growing & harvest cost [1/2 (6,512 + 5,780) @ 6.5%] (Tables 1&2)	399	
Total overhead cost/10A	9,264	
Total overhead cost/A	926	
Total overhead cost/lb @ 7,000 lbs/A	0.132	

Table 5. Total growing and harvesting costs for 10A (7,000 lbs/A) of bearing tart cherries, northwestern Michigan, 2002.

	Established Orchard	Your farm
Variable growing cost (Table 1)	\$ 6,512	
Variable harvest cost (Table 2)	5,780	
Overhead cost of established orchard (Table 4)	9,264	
Total cost	21,556	
Total cost/A	2,156	
Total cost/lb @ 7,000 lbs/A	0.308	

Table 6. Effect of varying marketable yield on cost/lb for tart cherries, northwestern Michigan, 2002.

Yield lb/A	Growing cost ¹	Harvest cost ²	Total variable cost	Your farm	Overhead cost ³	Total cost	Your farm
2,000	\$0.326	\$0.217	\$0.543		0.461	\$1.003	
4,000	0.163	0.118	0.281		0.231	0.512	
6,000	0.109	0.093	0.202		0.154	0.356	
7,000	0.093	0.083	0.176		0.132	0.308	
8,000	0.081	0.075	0.156		0.116	0.272	
10,000	0.065	0.064	0.129		0.093	0.222	
12,000	0.054	0.060	0.114		0.078	0.192	
14,000	0.047	0.054	0.101		0.067	0.167	

¹Table 1

²Table 3

³Table 4

**Table 7. Establishment costs for 10A of tart cherries (excluding interest),
northwestern Michigan, 2002.**

	Your Farm
Site preparation prior to year 1	
Orchard removal & cleanup @ \$300/A	\$3,000.00
Cover crops, taxes, etc. @ \$200/A	\$2,000.00
Total	\$5,000.00
Planting year (year 1)	
Ground preparation 6 hr labor @ \$13.53 /hr (\$11/hr + 23% benefits) & equipment @ \$23.53/hr	\$222.36
Marking: 5 hr @ \$13.53/hr labor & equipment @ \$15/hr	142.65
10 hr @ \$9.84/hr (\$8/hr + 23% benefits)	98.40
Trees: 125/A @ \$7/tree	8,750.00
Custom tree planting: @ \$.45 /tree	562.50
1/2 bale straw/tree @ \$1.50/bale	937.50
Spraying (4 times):	
8 hr labor @ \$11 + 23%	108.24
material	260.00
equipment @ \$26.83/hr	214.64
Herbicide spray: equipment, labor, materials	282.16
Permanent seeding (including land preparation, machinery, materials & labor)	379.10
Mouse bait; machinery, materials and labor @ \$10.22/A	102.20
Fertilizer: equipment & labor	113.36
1 lb/tree @ \$.12/tree	150.00
Deer control @ \$.50/tree	625.00
Management: 20 hr @ \$20/hr	400.00
Real estate taxes @ \$30/A	300.00
Total	\$13,648.11
Growing cost (year 2)	
Pruning: 10 hr @ \$13.53	\$135.30
Tree replacement: 8 hr @ \$13.53, 30 trees @ \$7 + equipment @ \$17/hr	454.24
Herbicide spray: equipment, labor, materials	301.86
Insect & disease control (4 times): equipment, labor, materials	582.88
Mow (2 times): labor & equipment @ \$7.28/A/mowing	145.60
Mouse control: equipment, materials and labor @ \$10.22/A	102.20
Fertilizer: equipment & labor	113.36
1 lb/tree @ \$.12/tree	150.00
Deer control @ \$.50/tree	625.00
Management: 15 hr @ \$20/hr	300.00
Real estate taxes @ \$30/A	300.00
Total	\$3,210.44
Growing cost (year 3)	
Pruning: 30 hr @ \$13.53	\$405.90
Tree replacement: 8 hr @ \$13.53, 20 trees @ \$7 + equipment @ \$17/hr	384.24
Herbicide spray: equipment, labor, materials	301.86
Insect & disease control (4 times): equipment, labor, materials	712.88
Mow (3 times): labor & equipment @ \$7.28/A/mowing	218.40
Mouse control: equipment, materials and labor @ \$10.22/A	102.20
Fertilizer: equipment & labor	113.36
2 lb/tree @ \$.12/tree	300.00
Deer control @ \$.30/tree	375.00
Management: 15 hr @ \$20/hr	300.00
Real estate taxes @ \$30/A	300.00
Total	\$3,513.84

(continued on next page.)

Table 7. Establishment costs for 10A of tart cherries (excluding interest), northwestern Michigan, 2002 (continued).

		Your Farm
Growing cost (year 4)		
Pruning: 40 hr @ \$13.53	\$541.20	
Tree replacement: 5 hr @ \$13.53, 10 trees @ \$7 + equipment @ \$17/hr	222.65	
Herbicide spray: equipment, labor, materials	301.86	
Insect & disease control (4 times): equipment, labor, materials	861.88	
Mow (3 times): labor & equipment @ \$7.28/A/mowing	218.40	
Mouse control: equipment, materials and labor @ \$10.22/A	102.20	
Fertilizer: equipment & labor	113.36	
3 lb/tree @ \$.12/tree	450.00	
Management: 20 hr @ \$20/hr	400.00	
Real estate taxes @ \$30/A	300.00	
Total	\$3,511.55	
Growing cost (year 5)		
Pruning: 50 hr @ \$13.53	\$676.50	
Tree replacement: 4 hr @ \$13.53, 10 trees @ \$7 + equipment @ \$17/hr	192.12	
Herbicide spray: equipment, labor, materials	301.86	
Insect & disease control (4 times): equipment, labor, materials	1,032.88	
Mow (3 times): labor & equipment @ \$7.28/A/mowing	218.40	
Mouse control: equipment, materials and labor @ \$10.22/A	102.20	
Fertilizer: equipment & labor	127.53	
4 lb/tree @ \$.12/tree	600.00	
Management: 30 hr @ \$20/hr	600.00	
Real estate taxes @ \$30/A	300.00	
Total	\$4,151.49	
TOTAL OF 5 YEARS	\$33,035.00	

Table 8. Total establishment costs, including interest, for 10A of tart cherries, northwestern Michigan, 2002.

Year	Growing cost	Interest on growing cost ¹ @ 6.5%	Interest on land ² @ 6.5%	Your farm	Annual total	Your farm	Accumulated cost	Your farm
Site preparation	\$5,000	\$163	\$3,250		\$8,413		\$8,413	
Planting year	13,648	990	3,250		17,888		26,301	
Year 2	3,210	1,814	3,250		8,274		34,575	
Year 3	3,514	2,362	3,250		9,126		43,700	
Year 4	3,512	2,955	3,250		9,717		53,417	
Year 5	4,151	3,607	3,250		11,008		64,425	

¹ Full year interest on accumulated cost + 1/2-year interest on current year cost.

² Land value is \$50,000 for 10 acres.

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