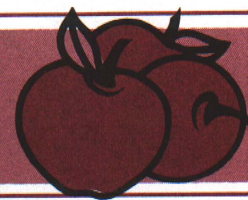


COSTS OF APPLE PRODUCTION IN WESTERN MICHIGAN



By Myron Kelsey and Larry Bradford¹

This cost evaluation of apple production in western Michigan is a projection of costs developed from small-group discussions with apple growers. Growers described common growing and harvesting practices used in the area. They agreed upon the size of apple acreage, equipment and cultural practices generally used by an average apple grower.

These figures do not reflect the average cost of apple production for all growers because costs vary considerably from farm to farm. In addition, overhead cost 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 1984 establishment cost and therefore overstate actual costs on currently producing orchards.

The data can help you develop your costs and better evaluate your farm situation. Each of the appropriate tables in this report includes a "Your Farm Cost" column for you to note costs for a particular operation. Where those costs cannot be determined, you may wish to adjust and substitute the study data.

The data were assembled assuming equipment and labor available for a hypothetical farm of 200 acres of diversified tree fruit, including 80 acres of apples. However, the data in Table 1 are presented for 10 acres of apples to make it easier for you to visualize many of the resource inputs.

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Labor Costs

The full-time labor classification includes the working time of the operator and regular hired help devoted to apples. Operator labor is not considered a cash expense by producers. But to allow for differences in the proportion of work performed by regular hired help, which is a cash expense, and the operator, both have been included at the \$8 per hour rate. As a result, producers who do a major portion of the work may have a lower cash labor cost than the figures indicate. This rate includes Social Security, Workers' Compensation and other fringe benefits. A \$6 per hour rate was used for skilled part-time help and \$4.80 per hour for manual labor.

Equipment Costs

Some major factors considered in the computation of equipment costs are initial cost, salvage value, years of life, annual usage, repair costs, insurance, interest and operating expenses, such as gas and oil. The operating costs for each piece of equipment are charged to the crop in Table 1 on the basis of direct hourly use of the equipment.

Variable costs are those that change directly with increases or decreases in the acreage of apples or yield. Examples of costs that vary with acreage are spray material, fertilizer, hired labor and machinery operating costs. Costs that vary directly with harvest yields are piecework rates.

Variable Costs

Variable costs incurred in apple production are categorized by labor, machinery and materials. The details of hours and types of labor, machinery used and hours of use, and kinds

and amounts of materials used by operation are shown in Table 1. If your costs for particular items are substantially higher than those shown, you may need to analyze those components closely to see if they can be reduced. A high cost for a particular component may be justified if it contributes to sufficiently higher yield or improved quality.

The variable costs incurred in harvesting an acre with estimated total production of 500 bushels of apples are shown in Table 2. Labor is the major cost. Therefore, good labor management should enhance the profit picture. In most cases, there will be some higher or lower costs for some items associated with higher or lower yields.

Overhead Costs

The overhead, or fixed cost, for apple production (Table 3) includes allocation of machinery overhead on the basis of the proportion of total farm use in apples, interest on orchard investment, orchard depreciation and property taxes. The fixed costs of machinery are allocated to apples on the basis of hours of use on apples relative to the total hours of equipment on the farm. These costs are detailed by operation in Table 1 but are only included in the totals in Table 3. Fixed costs of machinery include depreciation, interest on investment, insurance and housing costs.

You should evaluate your own farm situations and decide whether fixed costs should be considered as part of the total cost for your decision-making purposes. For instance, orchard overhead is a fixed cost if you own an orchard but a variable cost if you rent the orchard you're operating.

**Table 1. Growing Operations and Related Variable Costs for 10 Acres of Apple Production
Western Michigan, 1984**

Operation	Labor			Machinery						Materials		Total Variable Cost
	Labor per hr.	Wage Rate	Cost	Equipment	Hours of Use	Variable Cost/Unit	Total Variable Cost	Fixed Cost/Unit	Fixed Cost	Item	Cost Per 10 Acres	
Trimming (Heavy one year, light next)	150	\$8.00	\$1200.00	Power pruners & tower	150	\$1.66	\$249.00	\$ 4.76	\$714.00			\$1,767.00
	50	6.00	300.00	Chain saw	15	1.20	18.00	1.25	18.75			
Brush removal	10	6.00	60.00	60 h.p. tractor	10	6.79	67.90	5.93	59.30			145.00
				Brush rake or mower	10	1.71	17.10	4.02	40.20			
Mowings (3 times)	15	6.00	90.00	60 h.p. tractor	13	6.79	88.27	5.93	77.09			200.50
				Rotary mower	13	1.71	22.23	4.02	52.26			
Fertilizer (annual amt. applied every 3 yrs.)	1	8.00	8.00	40 h.p. tractor	1	5.08	5.08	4.45	4.45	50 lbs. ammonium nitrate/year @ \$175/ton	\$43.75	58.10
				Fertilizer spreader	1	1.27	1.27	8.92	8.92			
	1	8.00	8.00	40 h.p. tractor	1	5.08	5.08	4.45	4.45	100 lbs. 0-0-60 /yr. @ \$115/ ton	57.50	71.85
				Fertilizer spreader	1	1.27	1.27	8.92	8.92			
Lime	.5	8.00	4.00	Custom applied	(2 ton/acre: once every 10 years)					\$16/ton	3.20	7.20
Weed control (spray 3-1/3 acres)	5.0	8.00	40.00	40 h.p. tractor	4	5.08	20.32	4.45	17.80	1 qt. Paraquat@ \$10/qt.	33.33	129.71
				Weed sprayer	4	1.93	7.72	7.11	28.44	2.5 lbs. 80% Simozine@ \$3.20/lb.	26.67	
										Adjuvants 50 units/acre	1.67	
Bee rental										1 hive/3A. @ \$25	83.33	83.33
Spray Program Dormant	2.5	8.00	20.00	60 h.p. tractor	2.5	6.79	16.98	5.93	14.83			
				PTO sprayer	2.5	4.98	12.45	12.15	30.38			
Green tip-prepink	2.0	8.00	16.00	60 h.p. tractor	2.0	6.79	13.58	5.93	11.86	Chemical costs for insecticides, miticides fungicides and growth regulators@ \$296/acre	2,960	3,444.37
				PTO sprayer	2.0	4.98	9.96	12.15	24.30			
Prepink through 6th cover (10 sprays)	20	8.00	160.00	60 h.p. tractor	20.0	6.79	135.80	5.93	118.60			
				PTO Sprayer	20.0	4.98	99.60	12.15	243.00			
Well and pump operation				Elec. & repairs	10A	2.20	22.00	11.00	110.00			22.00
Mouse baiting	2	8.00	16.00	40 h.p. tractor	2	5.08	10.16	4.45	8.90	Zinc phosphide corn 10 lbs./A @ 18 cents/lb.	18.00	46.70
				Fertilizer spreader	2	1.27	2.54	8.92	17.84			
Tree replacement (annual cost—1st 1/2 orchard life)	3	6.00	18.00	40 h.p. tractor	1	5.08	5.08	4.45	4.45	2 trees/acre @ \$5/tree	100.00	123.27
				Trailer	1	.19	.19	4.10	4.10			
Management & labor supervision	50	8.00	400.00									400.00
Pick-up Operation				Pickup	750mi	.16	120.00	.38	285.00			120.00
TOTAL			\$2,340.00				\$951.58		[\$1,907.85]		\$3,327.45	\$6,619.03

Table 2. Variable Harvest Cost for 5,000 Bushels of Apples, Semi-Dwarf Orchard, Western Michigan, 1984

	Total	Your farm cost
Labor		
Full-time labor (80 hrs. × \$8.00)	\$ 640.00	_____
Part-time labor (10 hrs. × \$6.00)	60.00	_____
Piecework harvest (4,650 bu. × \$.87)	4,045.50	_____
Piecework drops (20 boxes × \$9.25)	185.00	_____
Equipment use:		
60 h.p. tractor (20 × \$6.79)	\$135.80	_____
trailer (20 × .19)	3.80	_____
forklift (10 × .75)	7.50	_____
truck (300 × .39)	117.00	_____
Total variable cost	\$5,194.60	_____
Cost per bushel	\$ 1.04	_____

Production Costs Per Hundredweight

Per-acre yields are very important in determining cost per bushel of apples (Table 4). Costs per bushel vary with yield because preharvest costs per acre—such as spraying, pruning, mowing, etc.—do not vary greatly, regardless of the yield obtained.

Table 3. Overhead Cost for Growing and Harvesting 10 Acres of Apples, Semi-Dwarf Orchard, Western Michigan, 1984

	Total	Your farm cost
Equipment, growing	\$ 1,907.84	_____
Equipment, harvest	423.00	_____
Interest on real estate value (10% × \$1,200/acre)	1,200.00	_____
Property taxes	200.00	_____
Interest on average orchard value (\$6,500/acre ÷ 2 × 12.5%)	4,062.50	_____
Orchard depreciation (\$6,500/acre ÷ 20)	3,250.00	_____
Interest on growing and harvest cost (\$11,813.63 × .5 × 12.5%)	738.35	_____
Total	\$11,781.69	_____

Table 4. Total Growing and Harvesting Costs for 10 Acres of Apples, Semi-Dwarf, Western Michigan, 1984 (500 Bu/Acre)

	Total	Your Farm Cost
Variable growing cost	\$ 6,619.03	_____
Variable harvest cost	5,194.60	_____
Overhead cost	11,781.69	_____
Total	\$23,595.32	_____
Total cost per bushel	4.72	_____

Table 5. Effect of Varying Yield on Cost/Bushel for Apples, Semi-Dwarf, Western Michigan, 1984

Yield Per Acre	Variable Growing Cost ¹	Variable Harvest Cost	Total Variable Cost	Your Farm Variable Cost	Overhead Cost ²	Total Cost	Your Farm Total Cost
----- Per Bushel -----							
300	2.21	1.04	3.25	_____	3.93	7.18	_____
400	1.65	1.04	2.69	_____	2.95	5.64	_____
500	1.32	1.04	2.36	_____	2.36	4.72	_____
600	1.10	1.04	2.14	_____	1.96	4.10	_____
700	.95	1.04	1.99	_____	1.68	3.67	_____
800	.83	1.04	1.87	_____	1.47	3.34	_____
900	.74	1.04	1.78	_____	1.31	3.09	_____
1000	.66	1.04	1.70	_____	1.18	2.88	_____

¹Variable growing cost of \$6,619.03 per 10 acres.

²Overhead cost of \$11,781.69 per 10 acres.

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