

Farm Business
Management
Reports

EB1720

1992 Estimated Cost
of Producing Red
Delicious Apples in
Central Washington

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NOTE

Enterprise costs and returns vary from one farm to the next and over time for any particular farm. Variability stems from differences in:

- Capital, labor, and management resources.
- Type and size of machinery complement.
- Cultural practices.
- Commodity and input prices.

Costs can also be calculated differently depending on the intended use of the cost estimate. The information in this publication serves as a general guide for a modern and well-managed apple orchard in Central Washington as of 1992. To avoid drawing unwarranted conclusions about costs and returns for any particular farm or group of farms, you must closely examine the assumptions used in this publication. If they are not appropriate for your situation. You should make adjustments in the costs and/or returns.

Contents

Introduction	1
Sources of Data	1
Budget Assumptions	1
Apple Production Costs	2
Discussion of Production Practices	3
Machinery, Equipment and Building Costs	4
Break-Even Returns	4
Summary of Receipts, Costs and Profitability Per Acre	5
Summary	5

Tables

1. Schedule of Operations and Estimated Costs Per Acre for Producing Apples in Central Washington	6
2. Itemized Cost Per Acre for Producing Apples in Central Washington	7
3. Materials and Services Provided by Operation	8-9
4. Per-Hour or Per-Acre Machinery, Equipment and Building Cost	10
5. Break-Even Returns Per Bin to the Apple Grower	11
6. Summary of Receipts, Costs and Profitability Per Acre	11
7. Net Returns Per Acre to Management and Risk for Varying Apple Yields and Per-Bin Returns to the Fruit Grower	12
8. Input Prices	12

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INTRODUCTION

The fruit growing area of Central Washington follows the Columbia River and a number of its tributaries. Suitable orchard sites range from river level to higher benches along the Columbia watershed. Near ideal weather patterns for red fruit color and consistently high yields make the area a world leader in Red Delicious apple production. The objective of this study is to estimate the costs and returns for producing Red Delicious apples in the area.

This information will help growers, prospective growers, agricultural lenders, and others concerned with the Washington tree fruit industry estimate the physical and financial requirements needed to produce Red Delicious apples. While acreages and practices outlined may not fit all conditions, they represent current trends.

SOURCE OF DATA

The data presented in this publication were provided by a committee of experienced apple growers from Central Washington. In group meetings, the growers described what they considered to be a common situation and the practices needed to produce apples. The growers estimated labor, equipment, and material requirements. From this information, we estimated labor, equipment, pesticides, fertilizers, taxes, interest, insurance, and other related costs. Committee members then reviewed the results to identify areas of possible misunderstanding. Due to the procedures used in this study, results in the publication

should be viewed as "typical" or "representative" of costs associated with producing apples in Central Washington rather than as a mathematical average of a large number of producers. Where factors such as land quality, orchard size, equipment complement, machinery use, cultural practices, and input prices differ from those assumed in this publication, quite different production costs may result.

BUDGET ASSUMPTIONS

The value of orchards in Central Washington varies considerably depending on the age of the trees and their current and potential production levels. The better apple orchards in this area are 10-20 years old with an annual production level of 40 bins or more per acre. Such an orchard is currently valued at about \$12,000 per acre. The objective of this study is to project what an existing planting would require in the way of equipment, materials, supplies, and labor, and what the potential returns would be under a 13-year planning horizon for a person purchasing this orchard. Specific assumptions are:

1. Orchard has 60 acres of apple trees.
2. Apple trees are spur on Malling Merton 106 rootstock.
3. Tree spacing is 10 x 20 feet yielding 218 trees per acre. About 25 crab apple and winter banana apple trees per acre are spread throughout the orchard for pollination purposes.

4. Estimated production is 40 bins or 1,000 boxes per acre.
5. Including the irrigation system, but excluding buildings, the orchard is currently valued at \$12,000 per acre. In 13 years, the value of the orchard will decrease, due to age of trees and the irrigation system, to about \$5,000 per acre.
6. An under-tree permanent sprinkler irrigation system with lateral lines every 40 feet and risers every 30 feet is used in this orchard. Annual repairs, primarily to sprinkler heads, is \$22 per acre. The total cost (irrigation charge and electricity) of delivering water under pressure is about \$70 per acre. The cost of the irrigation system is tied into the investment cost of the orchard.
7. Buildings on the 60 acres include a workshop and machine shed valued at \$20,000 and employee housing valued at \$60,000.
8. Replacement costs are used for all machinery, equipment, and buildings. The use of replacement prices may overstate costs currently being experienced by fruit growers. However, it provides an indication of the earnings needed to replace depreciable assets. Recent increases in prices paid for machinery and equipment mean that the depreciation claimed on older purchases substantially understates the amount of capital required to replace that asset. When looking at the long-term viability of the enterprise, it is important to consider its ability to replace its depreciable assets on a new cost basis.
9. The property tax on the orchard, irrigation system, machine shop and shed, and housing for labor, is \$90 per acre.
10. Regular full-time labor costs \$12.50 per hour plus housing. This includes wages, industrial insurance, social security, and other fringe benefits. Labor used to thin the apple trees is paid \$7.50 per hour and picking labor is paid \$10.50 per bin.

APPLE PRODUCTION COSTS

Estimated costs of production are shown in two tables. Table 1 outlines the schedule of field operations by calendar month, the type of machinery and labor used, and the hours used per acre for producing apples.

Costs of field operations are divided into two categories. The first is the cost of equipment, building and orchard ownership, or fixed costs. The second category, variable costs, is associated with operating equipment, hiring employees, and purchasing services and materials. Total cost is the sum of fixed costs and variable costs.

Equipment fixed costs include depreciation, interest on the average investment, property taxes, and insurance. These costs are incurred whether or not a crop is grown and do not vary with the enterprise, given ownership of a specific equipment complement. Per-hour fixed costs for equipment are determined by dividing the total annual fixed cost per machine by the annual hours of equipment use over all enterprises for the representative farm. For a specific field operation, equipment fixed costs are determined by multiplying the equipment hours per acre times the equipment per-hour fixed costs. Fixed costs

for the machine shed and shop, shop tools, and housing for labor are determined on a per-acre basis by dividing the total annual fixed cost by the number of acres. The per-hour (acre) fixed and variable costs for all equipment and buildings are presented in Table 4.

Interest on investment represents the opportunity cost (returns foregone by investing in the orchard) or interest paid to finance the purchase of the orchard. Total interest cost is calculated on the average value of the orchard (\$8,500) over a 13-year planning horizon. A 9% interest charge is made against this average value. Orchard depreciation costs represent the loss in orchard value over the 13-year period. These costs need to be recaptured over the life of the investment if the investment is to be profitable.

Variable costs depend directly on the number of acres. These costs include fuel, oil, repairs, fertilizer, chemicals, custom work, overhead (utilities, legal, accounting, etc.), and interest on operating capital. Labor is also included as a variable cost.

The second table, Table 2, presents a summary of costs appearing in Table 1. Most items are self-explanatory; however, "Tractor Interest," "Machinery Interest," and "Building Interest" warrant additional explanation. These figures represent opportunity costs (returns foregone by investing in the given equipment and building complement rather than in alternative investments) or interest paid to finance the given equipment and building complement.

Total interest cost on these capital purchases is calculated on the average value of the machinery and buildings over their respective years of use. The 9% interest

charge made against this "average" value represents the total interest cost.

DISCUSSION OF PRODUCTION PRACTICES

The practices used in this study, and outlined in Table 1, warrant some clarification. Pruning and training are performed only during the winter dormant period. Hand tools and ladders are used in the pruning operation. Prunings are chopped up with the rotary mower during the mowing operations.

The materials and services applied by operation throughout the year are summarized in Table 3. Insect control begins during March-April with dormant and prebloom sprays. Insects which damage the fruit require additional cover sprays from May through August. Frost control is used in the spring if warranted by weather conditions. A growth regulator is applied in April to promote higher quality apples.

Two chemical thinnings are applied in May plus one hand thinning in June. Fertilizer is applied twice a year in March and October. Weed control herbicides are applied in July and October. Gophers are controlled by applying strychnine milo with a gopher probe throughout the season. For mice, strychnine milo is mechanically applied in October.

The grass sod surrounding the trees requires four or more mowings per year; each mowing requires two trips across the field to complete the mowing of the space between rows. Irrigation, with a solid set system, requires 36-acre inches of water per year.

The harvest operation consists of simultaneously distributing and picking up the bins. About 20 pickers would be used

to harvest 60 acres. Each picker is supplied with a shoulder harness, picking bag, and ladder. The fruit is collected into large bins for transport out of the orchard by tractor to trucks which haul the bins of fruit to a centralized packinghouse. In this study, it was assumed that custom hauling to the packinghouse was used.

Particularly in North Central Washington, the producer must provide a certain amount of housing to attract skilled seasonal employees. The cost of this housing, as indicated in the budget, can be a substantial part of production costs.

MACHINERY, EQUIPMENT AND BUILDING COSTS

Table 4 presents the equipment and buildings used to derive the cost estimates, including current purchase prices, annual hours of use, and per-hour or per-acre fixed and variable costs.

Machinery, equipment, and building fixed costs include depreciation and interest on investment, property taxes, and insurance--costs that do not vary with the number of acres produced. Interest on investment represents a 9% opportunity cost to the enterprise. These are earnings foregone by investing money in the equipment and building complement rather than an alternative investment. This may also represent interest on funds borrowed to finance machinery, equipment, and building purchases.

Equipment variable costs include machinery and equipment repair, electricity, fuel, and lubrication costs--costs that vary with the number of acres produced.

BREAK-EVEN RETURNS

Break-even returns to the fruit grower for different levels of enterprise costs are presented in Table 5. The first break-even return is that necessary to cover total variable costs. If the return received does not equal or exceed this break-even return, producing apples becomes uneconomical, even in the short-run, because the added costs of production are greater than the added returns.

The second break-even return is that necessary to cover total cash costs, assuming no interest on outstanding loans or land rent. If other cash costs exist for your orchard, you must identify these costs and include them in the cash cost break-even return calculation. This return may be viewed as that return necessary to economically produce in the short-run.

The third break-even return is the total cash cost plus depreciation on machinery, buildings, and orchard investment. This return must be realized to stay in the business over the long-run.

If producers do not include the opportunity costs they forego from investing in the orchard, equipment, and buildings in calculating their total cost break-even return, they overlook the profitability of farming relative to alternative uses of their resources. Only if the fourth break-even value, the total cost break-even return, is received, will you be able to cover all of your out-of-pocket expenses, plus realize a competitive return to equity capital invested in land, trees, equipment, and buildings. Failure to obtain the break-even return means that you will not receive a return on capital contributions equal to what could be earned in an alternative use. Attainment of

a return above the fourth break-even level means that in addition to covering all cash and opportunity costs, you will get a return to management and to the risk assumed.

SUMMARY OF RECEIPTS, COSTS AND PROFITABILITY PER ACRE

Per-acre costs, returns, and profitability for apples under the given budget assumptions are presented in Table 6. Gross receipts are based on the assumption of 40 bins of Red Delicious, returning \$125 per bin to the grower. Final returns are calculated as net returns for management and risk. This is the return the owner-operator realizes for management and risk after accounting for all costs including \$12.50 per hour for any labor contributed to producing the crop.

SUMMARY

This study represents what experienced fruit growers in Central Washington anticipate from a planting of Red Delicious MM 106 rootstock in their prime production years. Under the assumptions of this study, if a person was to enter the apple production business given current interest rates, and a net price to the grower of \$125 per bin, the grower would likely find the venture to generate a modest return of about 8.9% to the average investment. However, for this study to be of practical use to potential investors, the assumptions require careful study. In the calculations to demonstrate profitability per-acre and break-even selling prices, an average production level of 40 bins per acre was assumed. Average production, however, differ markedly for different orchards and managers. Furthermore, apple prices may drop or rise in years to come. To help investors better analyze their potential situation, Table 7 illustrates likely per-acre returns from

varying yields and per-ton returns to the fruit grower. The solid line dividing the right-hand figures from those in the rest of the table indicates break-even combinations. Table 7 also shows that net returns are more responsive to a given percentage increase in price than to an equal percentage increase in yield.

Table 8 presents the list of prices used for selected inputs used in this study.

TABLE 1: SCHEDULE OF OPERATIONS AND ESTIMATED COSTS PER ACRE FOR PRODUCING APPLES IN CENTRAL WASHINGTON.

OPERATION	TOOLING	MTH YEAR	MACH	VARIABLE COST									TOTAL COST
				LABOR		TOTAL FIXED COST	FUEL, LUBE, & REPAIRS	LABOR	SERVICE	MATER.	INTER.	TOTAL VARIABLE COST	
				HOURS	HOURS	\$	\$	\$	\$	\$	\$	\$	
PRUNE & THIN	HAND LABOR, PRUNING TOOLS	NOV-MAR 1992		.00	21.00	11.69	.00	262.50	.00	.00	17.72	280.22	291.91
RAKE	50HP-WT, BRUSH RAKE	MAR 1992		.50	.55	6.49	1.91	6.88	.00	.00	.46	9.24	15.73
CHOP BRUSH	50HP-WT, ROTARY MOWER	MAR 1992		.50	.55	4.14	2.44	6.88	.00	.00	.49	9.80	13.95
FERTILIZE	50HP-WT, FERTILIZER SPREADER	MAR 1992		.33	.36	3.50	1.39	4.54	.00	40.00	2.41	48.34	51.84
DORMANT SPRAY	50HP-WT, BLAST SPRAYER	MAR 1992		.25	.28	3.22	.80	3.44	.00	12.72	.89	17.85	21.07
DELAYED DORMANT	50HP-WT, BLAST SPRAYER	MAR 1992		.50	.55	6.44	1.61	6.88	.00	38.18	2.45	49.11	55.55
POLLINATION	1.5 BEE HIVES PER ACRE	APR 1992		.00	.00	.00	.00	.00	41.25	.00	1.86	43.11	43.11
GROWTH REGULATOR	50HP-WT, BLAST SPRAYER	APR 1992		.33	.36	4.25	1.06	4.54	.00	81.00	3.90	90.49	94.74
PINK SPRAY	50HP-WT, BLAST SPRAYER	MAY 1992		.40	.44	5.15	1.29	5.50	.00	15.20	.82	22.81	27.96
FROST CONTROL	WIND MACHINE (3 PER 60 ACRES)	MAY 1992		1.20*	.50	67.75	13.95	6.25	.00	.00	.76	20.96	88.71
THINNING SPRAY	50HP-WT, BLAST SPRAYER	MAY 1992		.40	.44	5.15	1.29	5.50	.00	4.25	.41	11.45	16.60
POST BLOOM SPRAY	50HP-WT, BLAST SPRAYER	MAY 1992		.40	.44	5.15	1.29	5.50	.00	4.92	.44	12.15	17.30
IRRIGATE**	SOLID SET 36 AC.IN.	SEA 1992		.00	3.00	.00	.00	37.50	92.00	.00	5.83	135.33	135.33
MOW COVER (4X)	50HP-WT, ROTARY MOWER	SEA 1992		2.00	2.20	16.58	9.76	27.50	.00	.00	1.68	38.94	55.51
COVER SPRAY	50HP-WT, BLAST SPRAYER	JUN 1992		.40	.44	5.15	1.29	5.50	.00	16.08	.69	23.55	28.70
CALCIUM SPRAY	50HP-WT, BLAST SPRAYER	JUN 1992		.40	.44	5.15	1.29	5.50	.00	2.00	.26	9.05	14.20
HAND THINNING	LABOR, LADDERS	JUN 1992		.00	35.00	6.59	.00	262.50	.00	.00	7.88	270.37	276.97
HERBICIDE SPRAY	50HP-WT, WEED SPRAYER	JUL 1992		1.00	1.10	6.60	3.21	13.75	.00	5.53	.51	23.00	29.59
COVER SPRAY	50HP-WT, BLAST SPRAYER	JUL 1992		.40	.44	5.15	1.29	5.50	.00	16.08	.51	23.38	28.53
CALCIUM SPRAY	50HP-WT, BLAST SPRAYER	AUG 1992		.40	.44	5.15	1.29	5.50	.00	2.00	.13	8.92	14.07
MINOR INSECT SPY	50HP-WT, BLAST SPRAYER	AUG 1992		.40	.44	5.15	1.29	5.50	.00	7.09	.21	14.08	19.23
STOP DROP SPRAY	AERIAL APPLICATION	SEP 1992		.00	.00	.00	.00	.00	14.25	1.90	.12	16.27	16.27
BIN DIST & SWAMP	50HP-WT, BACKFORK	SEP 1992		8.00	8.80	45.72	22.77	110.00	.00	.00	1.00	133.77	179.48
PICKING	SUPERVISION	SEP 1992		.00	.00	.00	.00	.00	40.00	.00	.30	40.30	40.30
PICKING	LABOR, LADDERS, PICKING BAGS	SEP 1992		.00	.00	7.04	.00	.00	420.00	.00	3.15	423.15	430.19
LOADING	50HP-WT, HIGHLIFT FORK	SEP 1992		2.00	2.20	21.16	11.09	27.50	.00	.00	.29	38.88	60.04
HAULING	CUSTOM HIRE	SEP 1992		.00	.00	.00	.00	.00	90.00	.00	.68	90.67	90.67
HERBICIDE SPRAY	50HP-WT, WEED SPRAYER	OCT 1992		1.00	1.10	6.60	3.21	13.75	.00	17.54	.00	34.50	41.10
FERTILIZE	50HP-WT, FERTILIZER SPREADER	OCT 1992		.33	.36	3.50	1.39	4.54	.00	9.20	.00	15.13	18.62
GOPHER CONTROL	LABOR, GOPHER PROBE	SEA 1992		.00	.50	.16	.00	6.25	.00	.62	.31	7.18	7.34
MOUSE CONTROL	50HP-WT, FERTILIZER SPREADER	OCT 1992		.25	.28	2.65	1.05	3.44	.00	3.72	.00	8.21	10.86
CLEAN-UP & MISC	50HP-WT, TRAILER	ANN 1992		2.00	2.20	12.04	6.73	27.50	.00	.00	1.54	35.77	47.80
MISC USE	3/4 TON PICKUP 4X4	ANN 1992		8.33	8.33	76.10	31.81	104.12	.00	.00	6.12	142.05	218.16
MISC USE	FOUR WHEEL ATV	ANN 1992		5.00	.00	8.82	4.27	.00	.00	.00	.19	4.46	13.28
MISC USE	SHOP TOOLS	ANN 1992		.00	.00	52.33	.00	.00	.00	.00	.00	.00	52.33
BUILDINGS	MACHINE SHED AND SHOP 30 X 70	ANN 1992		.00	.00	30.11	1.67	.00	.00	.00	.08	1.74	31.85
BUILDINGS	LABOR QUARTERS	ANN 1992		.00	.00	90.33	8.00	.00	.00	.00	.36	8.36	98.69
OVERHEAD	UTILITIES, LEGAL, ACCT., ETC.	ANN 1992		.00	.00	.00	.00	.00	162.19	.00	.00	162.19	162.19
TAXES	PROPERTY TAX ON ORCHARD	ANN 1992		.00	.00	78.00	.00	.00	.00	.00	.00	.00	78.00
INVESTMENT COST	ORCHARD DEPRECIATION	ANN 1992		.00	.00	538.46	.00	.00	.00	.00	.00	.00	538.46
INVESTMT COST***	INTEREST ON ORCHARD INVESTMENT	ANN 1992		.00	.00	765.00	.00	.00	.00	.00	.00	.00	765.00
TOTAL PER ACRE				36.72	92.74	1916.45	138.40	984.23	859.69	278.03	64.43	2324.78	4241.23

*24 HOURS PER 60 ACRES.

**IRRIGATION INTEREST AND DEPRECIATION INCLUDED IN INVESTMENT COST.

***INTEREST ON AVERAGE ORCHARD VALUE.

TABLE 2: ITEMIZED COST PER ACRE FOR PRODUCING APPLES IN CENTRAL WASHINGTON.

		PRICE OR UNIT COST/UNIT	QUANTITY	VALUE OR COST	YOUR FARM
VARIABLE COSTS					
		\$		\$	
CALCIUM NITRATE	LB.	.10	400.00	40.00	_____
ZINC SULFATE	GAL.	1.59	8.00	12.72	_____
LORSBAN	PT.	6.22	3.00	18.66	_____
SUPERIOR OIL	GAL.	2.80	6.00	16.80	_____
SOLUBOR	LB.	.68	4.00	2.72	_____
PROMALIN	PT.	54.00	1.50	81.00	_____
CARBARYL	LB.	2.68	.50	1.34	_____
REGULOID	PT.	3.11	2.00	6.22	_____
NAA	OZ.	.95	3.70	3.52	_____
CARZOL	LB.	30.40	.50	15.20	_____
CALCIUM CHLORIDE	LB.	.40	20.00	8.00	_____
GUTHION	LB.	4.79	4.00	19.16	_____
SORBA-SPRAY MG	QT.	3.00	3.00	9.00	_____
ROUND-UP	QT.	16.75	.33	5.53	_____
PHOSPHAMIDON	PT.	14.17	.50	7.09	_____
SOLICAM	LB.	17.54	1.00	17.54	_____
AMMONIUM NITRATE	LB.	.09	100.00	9.20	_____
STRYCHNINE MILO	LB.	1.24	3.50	4.34	_____
RENTED BEE HIVE	HIVE	27.50	1.50	41.25	_____
IRRIG. CHG. & ELECT.	ACRE	70.00	1.00	70.00	_____
CUSTOM AERIAL	ACRE	14.25	1.00	14.25	_____
CUSTOM HAULING	BIN	2.25	40.00	90.00	_____
THINNING LABOR	HOUR	7.50	35.00	262.50	_____
FULLTIME LABOR	HOUR	12.50	57.74	721.74	_____
HARVEST SUPERVISION	BIN	1.00	40.00	40.00	_____
PICKING LABOR	BIN	10.50	40.00	420.00	_____
TRACTOR REPAIR	ACRE	24.41	1.00	24.41	_____
TRACTOR FUEL/LUBE	ACRE	35.79	1.00	35.79	_____
MACHINERY REPAIRS	ACRE	32.92	1.00	32.92	_____
MACHINE FUEL/LUBE	ACRE	35.62	1.00	35.62	_____
BUILDING REPAIRS	ACRE	9.67	1.00	9.67	_____
IRRIG. REPAIRS	ACRE	22.00	1.00	22.00	_____
OVERHEAD	ACRE	162.19	1.00	162.19	_____
INTEREST ON OP. CAP.	DOL.	.09	715.80	64.42	_____
TOTAL VARIABLE COST				2324.78	_____
FIXED COSTS					
		\$		\$	
TRACTOR DEPRECIATION	ACRE	58.91	1.00	58.91	_____
TRACTOR INTEREST	ACRE	48.11	1.00	48.11	_____
TRACTOR INSURANCE	ACRE	3.21	1.00	3.21	_____
TRACTOR TAXES	ACRE	9.62	1.00	9.62	_____
MACHINE DEPRECIATION	ACRE	172.00	1.00	172.00	_____
MACHINE INTEREST	ACRE	90.20	1.00	90.20	_____
MACHINE INSURANCE	ACRE	6.46	1.00	6.46	_____
MACHINE TAXES	ACRE	19.37	1.00	19.37	_____
BUILDING DEPRECIATION	ACRE	44.44	1.00	44.44	_____
BUILDING INTEREST	ACRE	66.67	1.00	66.67	_____
BUILDING INSURANCE	ACRE	4.00	1.00	4.00	_____
PROP. TAX ON BUILD.	ACRE	12.00	1.00	12.00	_____
PROP. TAX ON ORCHARD	ACRE	78.00	1.00	78.00	_____
INT. ON ORCH. INVEST*	ACRE	765.00	1.00	765.00	_____
DEPRE. ON ORCHARD*	ACRE	538.46	1.00	538.46	_____
TOTAL FIXED COST				1916.45	_____
TOTAL COST				4241.23	_____

*INCLUDES INTEREST AND DEPRECIATION ON THE ORCHARD SYSTEM.

30
25
2.50
5.00
100.00
45.00
4.00

500
400
1335.

3660

$\frac{3660}{40} = 91.5$

17 pks/bin \$/pk 5.38

Table 3: Materials and Services Provided by Operation.

<u>Operation</u>	<u>Month</u>	<u>Material and/or Service</u>
Fertilize	March	400 Lbs. of Calcium Nitrate @ 0.10¢/Lb.
Dormant Spray	March	8 Gals. of Zinc Sulfate @ \$1.59/Gal.
Delayed Dormant	March	3 Pints of Lorsban @ \$6.22/Pint 6 Gals. of Superior oil @ \$2.80/Gal. 4 Lbs. of Solubor @ 0.68¢/Lb.
Pollination	April	Rented 1.5 bee hives @ \$27.50/hive
Growth Regulator	April	1.5 Pints of Promalin @ \$54.00/pint
Pink Spray	May	0.5 Lbs. of Carzol at \$30.40/Lb.
Thinning Spray	May	1.2 Oz. of NAA @ 0.95¢/Oz. 1 Pint of Regulaid @ \$3.11/Pint
Post Bloom Spray	May	0.5 Oz. of NAA @ 0.95¢/Oz. 0.5 Lbs. of Carbaryl @ \$2.68/Lb. 1 Pint of Regulaid @ \$3.11/Pint
Irrigate	Season	Irrigation charge and electricity @ \$70.00/Acre
Cover Spray	June	2 Lbs. of Guthion @ \$4.79/Lb. 5 Lbs. of Calcium Chloride @ 0.40¢/Lb. 1.5 Quarts of Sorba-Spray Mg. @ \$3.00/Quart
Calcium Spray	June	5 Lbs. of Calcium Chloride @ 0.40¢/Lb.
Herbicide Spray	July	0.33 Quarts of Round-up @ \$16.75/Quart
Cover Spray	July	2 Lbs. of Guthion @ \$4.79/Lb. 5 Lbs. of Calcium Chloride @ 0.40¢/Lb. 1.5 Quarts of Sorba-Spray Mg. @ \$3.00/Quart
Calcium Spray	August	5 Lbs. of Calcium Chloride @ 0.40¢/Lb.
Minor Insect Spray	August	0.5 Pint of Phosphamidon @ \$14.17/Pint

Table 3: Materials and Services Provided by Operation
(Continued).

Operation	Month	Material and/or Service
Stop Drop Spray	September	Custom aerial application @ \$14.25/Acre 2 Ozs. of NAA @ 0.95¢/Oz.
Picking	September	Supervision for 40 bins @ \$1.00/bin
Picking	September	Picking labor for 40 bins @ \$10.50/bin
Hauling	September	Custom hauling for 40 bins @ \$2.25/bin
Herbicide Spray	October	1 Lb. of Solicam @ \$17.54/Lb.
Fertilize	October	100 Lbs. of Ammonium Nitrate @ 0.092¢/Lb.
Gopher Control	Season	0.5 Lb. of Strychnine Milo @ 1.24/Lb.
Mouse Control	October	3 Lbs. of Strychnine Milo @ \$1.24/Lb.
Overhead	Annual	7.5% of variable cost

TABLE 4: PER HOUR OR PER ACRE MACHINERY, EQUIPMENT AND BUILDING COST.

MACHINERY	PURCHASE PRICE	YEARS TO TRADE	ANNUAL HOURS	DEPRECIATION	INTEREST	INSURANCE	TAXES	HOUSING	TOTAL FIXED COST	REPAIR	FUEL AND LUBE	TOTAL VARIABLE COST	TOTAL COST
---\$ COST PER HOUR---													
50HP-WT, 4WD	20,000.00	15	500	2.41	2.19	.13	.39	.00	5.13	1.00	1.47	2.47	7.60
BRUSH RAKE	3,600.00	5	100	4.85	2.39	.14	.43	.00	7.81	1.10	.00	1.10	8.91
ROTARY MOWER	2,900.00	10	150	1.59	1.14	.07	.20	.00	3.00	2.17	.00	2.17	5.17
TRAILER	500.00	15	100	.33	.25	.02	.05	.00	.64	.65	.00	.65	1.29
FERTILIZER SPREADER	2,100.00	15	50	2.80	2.10	.13	.38	.00	5.40	1.50	.00	1.50	6.90
BLAST SPRAYER	10,000.00	10	200	4.11	2.94	.18	.53	.00	7.76	.50	.00	.50	8.26
WIND MACHINE	15,000.00	30	24	20.83	31.25	1.88	5.63	.00	59.58	5.42	6.21	11.63	71.21
WEED SPRAYER	1,600.00	10	200	.66	.47	.03	.08	.00	1.24	.50	.00	.50	1.74
BACKFORK	300.00	10	150	.20	.10	.01	.02	.00	.32	.13	.00	.13	.46
HIGH-LIFT FORK	5,200.00	10	150	2.85	2.04	.12	.37	.00	5.38	2.83	.00	2.83	8.22
4-WHEEL ATV	3,400.00	6	400	1.21	.49	.03	.09	.00	1.81	.25	.60	.85	2.67
3/4 TON PICKUP 4X4	20,000.00	5	500	6.40	2.40	.14	.43	.00	9.38	.80	3.02	3.82	13.19
GOPHER PROBE	60.00	10	30	.20	.10	.01	.02	.00	.32	.00	.00	.00	.32
PICKING EQUIPMT	30.00	3	50	.20	.03	.00	.01	.00	.24	.00	.00	.00	.24
LADDER	96.00	10	80	.12	.06	.00	.01	.00	.19	.00	.00	.00	.19
PRUNING TOOLS	30.00	4	25	.30	.06	.00	.01	.00	.37	.00	.00	.00	.37
---\$ COST PER ACRE---													
MACH SHED & SHOP	20,000.00	30	-	11.11	16.67	1.00	3.00	.00	31.78	1.67	.00	1.67	33.44
SHOP TOOLS	20,000.00	10	-	33.33	16.67	1.00	3.00	.00	54.00	.00	.00	.00	54.00
LABOR QUARTERS	60,000.00	30	-	33.33	50.00	3.00	9.00	.00	95.33	8.00	.00	8.00	103.33

TABLE 5: BREAK-EVEN RETURNS PER BIN TO THE APPLE GROWER.

	COST PER ACRE*	YOUR FARM	BREAK-EVEN RETURN/BIN**	YOUR FARM
	\$	\$	\$	\$
1. TOTAL VARIABLE COSTS	2,324.78	_____	58.12	_____
PLUS: INS. & TAXES ON TRAC., MACH., & BLDG.	54.66	_____		
TAXES ON ORCHARD	78.00	_____		
2. TOTAL CASH COSTS	2,457.44	_____	61.44	_____
PLUS: DEPR. ON TRAC., MACH., & BLDG.	275.35	_____		
DEPR. ON ORCHARD	538.46	_____		
3. TOTAL CASH COSTS + DEPR.	3,271.25	_____	81.78	_____
PLUS: INT. ON TRAC., MACH., & BLDG.	204.98	_____		
INT. ON ORCHARD INVESTMENT	765.00	_____		
4. TOTAL COST	4,241.23	_____	106.03	_____

*EXCLUDING MANAGEMENT, MARKETING, AND PACKAGING COSTS.

**ASSUMES 40 BINS PER ACRE.

TABLE 6: SUMMARY OF RECEIPTS, COSTS AND PROFITABILITY PER ACRE.

	PRICE/ BIN	QUANTITY	VALUE OR COST	YOUR FARM
			\$	\$
GROSS RECEIPTS APPLES	\$125.00	40 BINS	<u>\$5,000.00</u>	_____
1. TOTAL RECEIPTS			5,000.00	_____
LESS: TOTAL VARIABLE COST			2,324.78	_____
2. RETURNS OVER VARIABLE COST			2,675.22	_____
LESS: TRACTOR, MACHINERY, AND BUILDING FIXED COST			534.99	_____
PROPERTY TAX ON ORCHARD			78.00	_____
INTEREST ON ORCHARD INVESTMENT			765.00	_____
DEPRECIATION ON ORCHARD			538.46	_____
3. NET RETURNS TO MANAGEMENT AND RISK			758.77	_____

TABLE 7: NET RETURNS PER ACRE TO MANAGEMENT AND RISK FOR VARYING APPLE YIELDS AND PER-BIN RETURNS TO THE FRUIT GROWER.

BINS	\$75 PER BIN*	\$100 PER BIN*	\$125 PER BIN*	\$150 PER BIN*	\$175 PER BIN*
	\$	\$	\$	\$	\$
30	-1,791	-1,041	- 291	459	1,209
35	-1,516	- 641	234	1,109	1,984
40	-1,241	- 241	759	1,759	2,759
45	- 967	158	1,283	2,408	3,533
50	- 692	558	1,808	3,058	4,308

*RETURNS RECEIVED BY THE PRODUCER AFTER PAYING MARKETING AND PACKAGING COSTS.

TABLE 8: INPUT PRICES.

ITEM	UNIT	PRICE
		\$
<u>Fertilizers:</u>		
Ammonium Nitrate 34-0-0	Lb.	.092
Calcium Nitrate 15.5-0-0	Lb.	.10
Calcium Chloride	Lb.	.40
Zinc Sulfate	Gal.	1.59
Sorba-Spray Mg.	Qt.	3.00
<u>Herbicides:</u>		
Round-up	Qt.	16.75
Solicam	Lb.	17.54
Solubor	Lb.	.68
<u>Insecticides:</u>		
Superior Oil	Gal.	2.80
Lorsban	Pt.	6.22
Guthion	Lb.	4.79
Phosphamidon	Pt.	14.17
Carzol	Lb.	30.40
<u>Growth Regulators:</u>		
Carbaryl	Lb.	2.68
Regulaid	Pt.	3.11
Promalin	Pt.	54.00
NAA	Oz.	.95
<u>Rodenticide:</u>		
Strychnine Milo	Lb.	1.24
<u>Other:</u>		
Diesel	Gal.	.85
Gasoline	Gal.	1.05
Aerial Spraying	Acre	14.25
Rented Bee Hives	Hive	27.50
Custom Hauling	Bin	2.25
Full-Time Labor	Hour	12.50
Thinning Labor	Hour	7.50
Pickers	Bin	10.50
Supervisor	Bin	1.00

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