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# Enterprise Cost Study for Marion Blackberries

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**OREGON STATE UNIVERSITY EXTENSION SERVICE**

## ENTERPRISE COST STUDY FOR MARION BLACKBERRIES

### Establishment Years, Every Year Production, and Alternate Year Production in the Mid-Willamette Valley

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#### Background

This study estimates the cost of producing Marion Blackberries in the Mid-Willamette Valley of Oregon. Marion Blackberries are a labor intensive crop that require better than average soils and considerable capital investment to establish.

There are about 3,300 acres of Blackberries grown in Oregon, with a value in 1985 of \$13,000,000. This crop is grown in two production systems: bearing every year and bearing in alternate years. Thus, this study includes enterprise budgets for the establishment years and for every year and alternate year methods of production.

The total costs for the establishment years 1 and 2 are amortized at 10% for the following 11 years to allocate these establishment costs on an annual basis over the life of the planting.

The study does not reflect a specific operation, nor is it meant to serve as a reference for cultural operations. Rather, it is intended as a guide or starting point for growers to use in developing their own costs of production, as well as for lenders, extension agents, field representatives and prospective growers to use in a similar manner.

The costs of production for establishment and bearing years are presented in tables 1 through 4. The berry planting is assumed to be 10 acres on a 75 acre farm, with 622 plants per acre for every year production and an average yield at maturity of 7,000 lbs. per acre (Tables 1 and 2). The alternate year production is based on a planting of 726 plants per acre with yields at maturity of 12,000 lbs. per acre hand picked and 10,000 lbs. per acre machine picked. (Hand picking only is used in Tables 3 and 4.)

#### Cultural Practices

The practices used in this study represent the most typical for a given crop year and include pruning, training, fungicide and insecticide

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The authors are, respectively, Extension agent (agriculture), Extension agent (small fruits), and Extension economist, in cooperation with Mid-Willamette Valley producers.

sprays, weed control, harvest and cultivation, among others. For specific recommendations, please refer to OSU spray guides or consult with your local OSU Extension Agent or field representatives. Inputs and their prices are listed in table 5.

Each practice listed includes the hours and cost of labor and machinery, and the cost of materials used in each operation. Hired labor is charged at \$5.85 per hour for skilled labor and \$4.25 per hour for non-skilled labor including SAIF, FICA, Social Security, and benefits. All owner/operator labor is charged at the \$5.85 per hour rate and is shown as a cash cost.

A 50 hp tractor is used for most operations at the rate of \$10.77 per hour at an annual use of 1,000 hours. The machinery column includes both cash and non-cash costs of operation. Total cash machinery costs are estimated to be 60% of total machinery costs, and total non-cash machinery costs represent 40% of total machinery costs.

The machinery complement and costs are shown in Table 6. Costs are calculated using current prices obtained from machinery dealers and cost of operation formulas from the American Society of Agricultural Engineers, "1979 Agricultural Engineer's Yearbook."

### Harvest Costs

Harvest costs include all costs of picking, loading, hauling and selling the crop. They are treated as custom costs.

### Other Charges

The land charge is included at a rental rate of \$125 per acre per year, reflecting either an actual rental cost or the market value of the land if it was rented to others. The opportunity cost of the capital investment if the land was sold and the capital reinvested was not considered as an alternative in this study.

Operating capital interest is based on cash costs, excluding harvest costs, at 10% for six months. The general overhead is charged at 7% of cash costs excluding harvest costs and operating capital interest. Overhead represents utilities, accounting fees, legal fees, telephone, etc.

### Total Costs

The total cost column represents the labor, machinery, and materials cost for each operation, and for the total enterprise on a per acre basis. The cost of production in cents per lb. is shown for various yields. It is adjusted for lower and higher harvest costs and berry commission charges when the yield is different from that shown within the budget.

Growers' returns over and above the cost of production total shown in this study will represent funds available as return on investment to land and management.

### Summary of Cost of Production and Net Margins

Table 7 summarizes the yield and production costs for each method of production on an annual and cumulative basis. Table 8 shows the cumulative total revenue and net margins for both production methods when five prices for the berries are used: \$.35, \$.40, \$.45, and \$.50 and \$.55/lb.

These tables are based on the assumption that yields and cost of production remain fairly constant over time, which of course would not occur in a real situation. However, with all else being equal, the bottom line total - accumulated net margin - does offer a means of comparing alternate and every year production methods.

The average cost of production over 11 years is \$36/lb. for alternate and \$.40/lb. for every year production. The cumulative net margins are greater for the alternate year production method, under the cost assumptions of this study, varying from 56% higher at \$.45/lb. to 7% greater at \$.55/lb. The net margin data is presented graphically in Figure 1 for prices ranging from 0 to 0.80 cents per pound. This graph shows that for prices above \$0.63 per pound, every year production is the most profitable. At prices below \$0.63 per pound, production in alternate years is most profitable.

Table 1. Marion Blackberries Establishment Costs Per Acre for Every Year Production.

BASED ON:

1. 10 acres on a 75 acre farm
2. Yields: Year 1 0  
Year 2 2000 lbs
3. Hired labor \$4.25/hr.
4. Skilled labor \$5.85/hr.
5. 622 plants per acre

	LABOR HRS.	VALUE	MACHINERY	OTHER ITEM	COST	TOTAL COST
<b>YEAR 1</b>						
Plow	1	\$ 5.85	\$17.29			\$ 23.14
Disc & harrow (3X)	1	5.85	14.52			20.37
Lime (3 Ton)				custom	\$100.00	100.00
Layout field (2 men)	1	4.25		material	5.00	9.25
Pre-plant insect.				custom	20.80	20.80
Plant (4 men)	10	42.50		plants	248.80	291.30
Hand fert. (3 men)	1	4.25		fert.	26.75	31.00
Lay canes in row	6	25.50				25.50
Cultivate (10X)	5	29.25	72.60			101.85
Irrigate (3X@ 6 in.)	4	9.00	50.00	elec.	8.00	67.00
Herbicide				custom	33.00	33.00
Dig holes & set posts				custom	120.00	120.00
Posts-200 @ \$2.75				posts	550.00	550.00
Tighten & staple	4	23.40		wire	346.50	369.90
Hand hoe (3X)	16	68.00				68.00
Train canes (fall)	12	51.00				51.00
<b>YEAR 2</b>						
Dorm & sprspray (3X)	3	17.55	39.00	chem.	44.35	100.90
Herbicide				custom	12.32	12.32
Fert. (spr)	1	5.85	14.25	fert.	40.13	60.23
Preharvest cult.						
rotovate (1X)	1	5.85	17.52			23.37
cultivate (5X)	2.5	14.63	28.80			43.43
Irrigate (3X-6 in.)	4	9.00	50.00	elec.	8.00	67.00
Train canes in row	10	42.50				42.50
Remove old canes	6	25.50				25.50
Flail chop canes	1	5.85	15.64			21.49
<b>HARVEST BABY CROP (2000#)</b>						
\$ .11/LB Picking					220.00	220.00
\$ .03/LB Hauling					60.00	60.00
<b>OTHER CHARGES</b>						
Land rental (2 yrs.)					250.00	250.00
Oper. cap. int.					139.82	139.82
Berry commission \$4.00/ton					4.00	4.00
General overhead					150.57	150.57
<b>TOTAL CASH COSTS</b>		<b>395.58</b>	<b>191.77</b>		<b>2,010.19</b>	<b>2,597.54</b>
<b>TOTAL NON-CASH COSTS</b>			<b>127.85</b>		<b>250.00</b>	<b>377.85</b>
<b>TOTAL COST</b>		<b>395.58</b>	<b>319.62</b>		<b>2,260.19</b>	<b>2,975.39</b>
<b>CREDIT FOR BABY CROP (2000 # @ \$.40)</b>						<b>-800.00</b>
<b>NET ESTAB. COST</b>						<b>2,175.39</b>
<b>AMORTIZATION OF ESTABLISHMENT COSTS (10% FOR 11 yrs)</b>				<b>ANNUAL</b>		<b>\$334.93</b>

Table 2. Marion Blackberries Cost of Production Per Acre for Every Year Production.

BASED ON:

- |                                    |                             |
|------------------------------------|-----------------------------|
| 1. 10 acres on a 75 acre farm      | 3. Hired labor \$4.25/hr.   |
| 2. Yields: Year 2 2000 lbs. (hand) | 4. Skilled labor \$5.85/hr. |
| Year 3 4000 lbs. (hand)            | 5. 622 plants per acre.     |
| Year 4-15 7000 lbs. (hand)         |                             |

	LABOR HRS.	VALUE	MACHINERY	ITEM	OTHER COST	TOTAL COST
<b>CULTURAL OPERATIONS</b>						
Fall & winter herb.	1	\$ 5.85	\$12.77	Chem.	\$ 17.70	\$ 36.32
Train canes	60	255.00				255.00
Fungicide (12 MO) (6X)	6	35.10	85.02	Chem.	73.65	193.77
Cane borer drench	1	5.85	14.17	Chem.	4.25	24.27
Fruit worm spray	1	5.85	14.17	Chem.	5.89	25.91
Rotovate (4X)	4	23.40	70.08			93.48
Cultivate (4X)	4	23.40	62.56			85.96
Spring fert.	1	5.85	14.25	Fert.	64.20	84.30
Train canes in row	15	63.75				63.75
Summer herb.	2	11.70	25.54	Chem.	9.44	46.68
Irrigate (2X, 8 in.)	4	17.00	52.00	Elec.	15.00	84.00
Remove old canes	15	63.75				63.75
Flail chop canes	1	5.85	15.64			21.49
<b>HARVEST COSTS (@7000 lbs.)</b>						
\$.11/lb Picking		770.00				770.00
\$.03/lb Hauling		210.00				210.00
<b>OTHER CHARGES</b>						
Land rental @ \$125/ac					125.00	125.00
Oper. Cap. interest @ 13%					62.13	62.13
Berry commission \$4.00/ton					28.00	28.00
General overhead					64.95	64.95
<b>TOTAL CASH COSTS</b>		<b>1,502.35</b>	<b>219.72</b>		<b>345.22</b>	<b>2,067.29</b>
<b>TOTAL NON-CASH COSTS</b>			<b>146.48</b>		<b>125.00</b>	<b>271.48</b>
<b>AMORTIZED OF ESTABLISHMENT COSTS</b>						<b>334.93</b>
<b>TOTAL PRODUCING YEARS COSTS</b>		<b>1,502.35</b>	<b>366.20</b>		<b>805.15</b>	<b>2,673.70</b>
<b>TOTAL COST PER LB. @</b>						
4000 lb/ac					cents/lb	0.563
6000 lb/ac						0.422
7000 lb/ac						0.382
8000 lb/ac						0.352
10000 lb/ac						0.309

Table 3. Marion Blackberries Establishment Costs Per Acre for Alternate Year Production.

BASED ON:

1. 10 acres on a 75 acre farm
2. Yields: Year 1 0  
Year 2 2000 lbs
3. Hired labor \$4.25/hr.
4. Skilled labor \$5.85/hr.
5. 726 plants per acre

	LABOR HRS.	VALUE	MACHINERY	OTHER ITEM	COST	TOTAL COST
<b>YEAR 1</b>						
Plow	1	\$ 5.85	\$ 17.29			\$ 23.14
Disc & harrow (3X)	1	5.85	14.52			20.37
Lime (3 Ton)				Custom	\$100.00	100.00
Layout field (2 men)	1	4.25		Material	5.00	9.25
Pre-plant insect.				Custom	20.80	20.80
Plant (4 men)	10	42.50		Plants	290.40	332.90
Hand fert. (3 men)	1	4.25		Fert.	26.75	31.00
Lay canes in row	6	25.50				25.50
Cultivate (10X)	5	29.25	72.60			101.85
Irrigate (3X @ 6 in.)	4	9.00	50.00	Elec.	8.00	67.00
Herbicide				Custom	33.00	33.00
Dig holes & set posts				Custom	120.00	120.00
Posts - 200 @ \$2.75				Posts	550.00	550.00
Tighten & staple	4	23.40		Wire	346.50	369.90
Hand hoe (3X)	16	68.00				68.00
Train canes (fall)	12	51.00				51.00
<b>YEAR 2</b>						
Dorm & spr spray (3X)	3	17.55	39.00	Chem.	44.35	100.90
Herbicide				Custom	12.32	12.32
Fert. (spr)	1	5.85	14.25	Fert.	40.13	60.23
Preharvest cult.						
rotovate (1X)	1	5.85	17.52			23.37
cultivate (5X)	2	14.63	28.80			43.43
Irrigate (3X - 6 in.)	4	9.00	50.00	Elec.	8.00	67.00
Train canes in row	10	42.50				42.50
Remove old canes	6	25.50				25.50
Flail chop canes	1	5.85	15.64			21.49
<b>HARVEST BABY CROP (2000#)</b>						
\$ .11/lb Picking					220.00	220.00
\$ .03/lb Hauling					60.00	60.00
<b>OTHER CHARGES</b>						
Land rental (2 yrs.)					250.00	250.00
Berry commission \$4.00/ton					4.00	4.00
Oper. cap. Int.					142.52	142.52
General overhead					153.48	153.48
<b>TOTAL CASH COSTS</b>		<b>395.58</b>	<b>191.77</b>		<b>2,057.40</b>	<b>2,644.76</b>
<b>TOTAL NON-CASH COSTS</b>			<b>127.85</b>		<b>250.00</b>	<b>377.85</b>
<b>TOTAL COST</b>		<b>395.58</b>	<b>319.62</b>		<b>2,307.40</b>	<b>3,022.60</b>
<b>CREDIT FOR BABY CROP (2000 # @ \$.40)</b>						<b>-800.00</b>
<b>NET ESTAB. COST</b>						<b>2,222.60</b>
<b>AMORTIZATION OF ESTABLISHMENT COSTS (10% for 11 yrs)</b>				<b>ANNUAL</b>		<b>\$342.20</b>

Table 4. Marion Blackberries Cost of Production Per Acre for Alternate Year Production.

BASED ON:

1. 10 AC. on a 75 AC. farm.
2. Yields: Year 1-0, year 2-2000 # (hand)  
Year 3-15: 12000 # (hand)
3. Hired labor \$4.25/hr.
4. Skilled labor \$5.85/hr.
5. 726 plants/ac.

	LABOR HRS.	VALUE	MACHINERY	OTHER ITEM	COST	TOTAL COST
<b>BEARING YEAR</b>						
Fungicide	1	\$ 5.85	\$ 14.17	Chem.	\$ 9.30	\$ 29.32
Herbicide	1	5.85	12.77	Chem.	17.70	36.32
Dormant spray	1	5.85	14.17	Chem.	29.38	49.40
Fertilize	1	5.85	14.25	Fert.	64.20	84.30
Herbicide (2X)	2	11.70	25.54	Chem.	9.44	46.68
Crown borer	1	5.85	14.17	Chem.	4.25	24.27
Fungicide	1	5.85	14.17	Chem.	11.79	31.81
Fruit worm spray	1	5.85	14.17	Chem.	5.89	25.91
Fruit rot spray (2X)	2	11.70	28.34	Chem.	36.00	76.04
Irrigation (2X) 8 in.	4	17.00	52.00	Elec.	15.00	84.00
Insect spray	1	5.85	14.17	Chem.	10.83	30.85
Picking \$.11/lb @ 6 ton				Custom	1,320.00	1,320.00
Hauling \$.03/lb @ 6 ton				Custom	360.00	360.00
<b>NON-BEARING YEAR</b>						
Cut canes	2	11.70	24.54			36.24
Remove canes	15	63.75				63.75
Flail chop canes	1	5.85	15.64			21.49
Herbicide	1	5.85	12.77	Chem.	2.34	20.96
Herbicide	1	5.85	12.77	Chem.	7.49	26.11
Fertilize	1	5.85	14.25	Fert.	55.06	75.16
Crown borer	1	5.85	14.17	Chem.	4.25	24.27
Disc (1X)	0	2.93	7.51			10.44
Rotovate (4X)	4	23.40	70.08			93.48
Flail or cult. (4X)	4	23.40	62.56			85.96
Training	51	216.75				216.75
Irrigation (2X) 8 in.	4	17.00	52.00	Elec.	15.00	84.00
Fungicide (2X)	2	5.85	28.34	Chem.	7.18	41.37
<b>OTHER COST</b>						
Land rental (2 yrs.)					250.00	250.00
Oper. cap. interest					56.49	56.49
Berry commission \$4.00/ton					24.00	24.00
Overhead					44.43	44.43
<b>TOTAL CASH COSTS</b>		<b>481.23</b>	<b>319.53</b>		<b>2,110.03</b>	<b>2,910.79</b>
<b>TOTAL NON-CASH COSTS</b>			<b>213.03</b>		<b>250.00</b>	<b>463.03</b>
<b>AMORT. EST. COSTS (2 yrs.)</b>					<b>684.40</b>	<b>684.40</b>
<b>TOTAL COSTS FOR 2 YRS</b>		<b>481.23</b>	<b>532.56</b>		<b>3,044.43</b>	<b>4,058.22</b>
<b>TOTAL COST/LB. @ 8000 lb/ac. cents/lb 0.437</b>						
						<b>0.378</b>
						<b>0.338</b>
						<b>0.310</b>



Table 5. Operating Inputs and Prices.

ITEM	UNIT	PRICE/UNIT (\$)
FERTILIZERS		
LIME	TON	33.33
UREA	LB	.11
AMMON. NITRATE	LB	.11
AMMON. SULFATE	LB	.07
16-20-0	LB	.10
SOLUTION 32	LB	.08
SOLUBOR	LB	.67
KCL	LB	.67
HERBICIDES		
SIMAZINE	LB	3.50
PARAQUAI	GAL	48.00
DEURINOL	LB	7.75
DYFONATE	GAL	37.00
INSECTICIDES		
DIAZINON	LB	4.25
SEUIN	LB	3.10
DIMETHOATE 267	QT	4.75
THIODAN	LB	5.50
LANNATE	LB	17.25
FUNGICIDES		
BENLATE	LB	12.50
DICHLONE	LB	7.35
LIME-SULFUR	GAL	6.25
RONILAN	LB	20.00
KOCIDE 101	LB	2.25
SULFUR	LB	.22
OIL	PINT	4.50

Table 6. Machinery Complement and Costs Used in the Study.

MACHINE	SIZE	INITIAL INVEST. (\$)	SALVAGE VALUE (\$)	LIFE (HRS)	ANNUAL USE (HRS)	TOTAL COST (\$/HR)
Wheel Tractor	45 hp	13,700	4,000	10	1,200	7.43
Wheel Tractor	50 hp	16,000	5,310	10	1,000	10.77
Wheel Tractor	65 hp	18,700	5,500	10	1,200	10.48
Pick-Up	1/2 ton	10,000	3,300	5	250	16.64
Flatbed Trailer	2 axle	1,500	300	15	100	3.62
Front-end Loader		3,500	1,000	15	100	6.24
Sprayer <PTO>	300 gal	8,400	2,500	15	250	6.96
Sprayer <PTO>	200 gal	5,000	2,000	15	250	3.40
Sprayer <PTO>	100 gal	1,300	400	15	130	2.00
Fert. Spreader	800 lb.	1,000	200	20	50	3.48
Disc	10 ft	3,600	750	10	185	4.26
Harrow	10 ft.	1,000	200	20	120	1.49
Plow	3-18, 2x	5,800	800	12	200	6.52
Flail Mower	10 ft	3,000	900	10	150	4.87
Rototiller	6 ft	4,500	800	10	200	6.75
Cane Cutter	1-row	3,000	500	10	75	1.50

Table 7. Annual and Cumulative Costs of Production for Marion Blackberries.

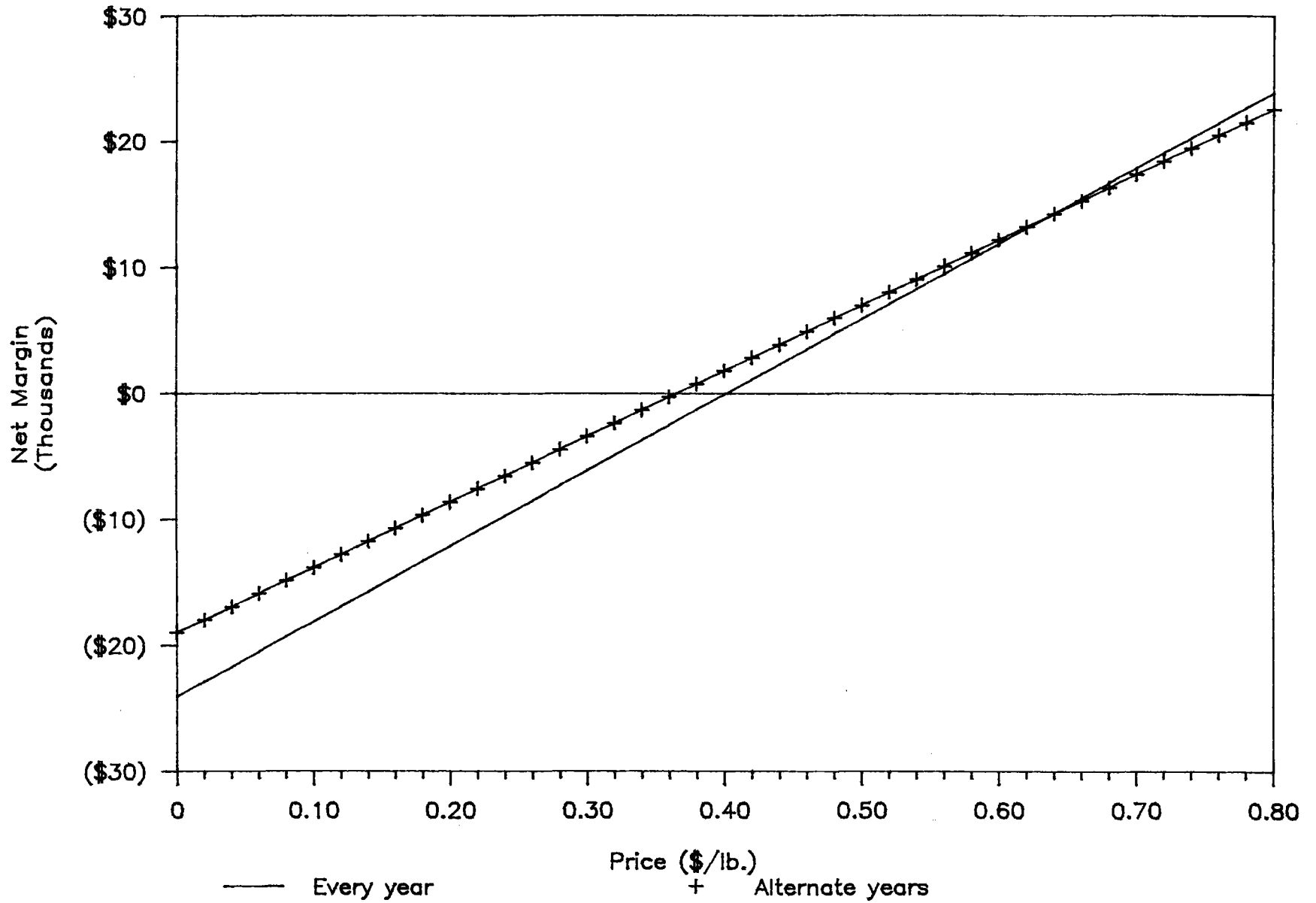
YEAR	ALTERNATE YEAR				EVERY YEAR				CUMULATIVE COST/LB	
	PRODUCING YEARS		CUMULATIVE		PRODUCING YEARS		CUMULATIVE		ALTERNATE	EVERY
	PROD LB	COST \$/2YR	PROD LB	COST \$/YR	PROD LB	COST \$/YR	PROD LB	COST \$/YR		
1 ESTAB.	0				0					
2 ESTAB.	0	(2175)*	0	(2175)*	0	(2223)*	0	(2223)*		
3	4000	2739.78	4000	2739.78	4000	2673.70	4000	2673.70	.68	.67
4	0	1318.44	4000	4058.22	7000	2673.70	11000	5347.40	1.01	.49
5	12000	2739.78	16000	6798.00	7000	2673.70	18000	8021.10	.42	.45
6	0	1318.44	16000	8116.44	7000	2673.70	25000	10694.80	.51	.43
7	12000	2739.78	28000	10856.22	7000	2673.70	32000	13368.50	.39	.42
8	0	1318.44	28000	12174.66	7000	2673.70	39000	16042.20	.43	.41
9	12000	2739.78	40000	14914.44	7000	2673.70	46000	18715.90	.37	.41
10	0	1318.44	40000	16232.88	7000	2673.70	53000	21389.60	.41	.40
11	12000	2739.78	52000	18972.66	7000	2673.70	60000	24063.30	.36	.40
TOTAL			52000	18972.66			60000	24063.30	.36	.40

\*NOTE: Year 2 is net cost after baby crop and it is included as an amortized cost at 10% for 11 years.

Table 8. Cumulative Revenue and Net Margin, Per Acre.

Price	Alternate Year		Every Year	
	Revenue \$	Net Margin \$	Revenue \$	Net Margin \$
.35	18,200	-772.66	21,000	-3,863.30
.40	20,800	1,827.34	24,000	-63.30
.45	23,400	4,427.34	27,000	2,936.70
.50	26,000	7,027.34	30,000	5,936.70
.55	28,600	9,627.34	33,000	8,936.70

Figure 1. Cumulative Net Margins for Marion Blackberries



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