

Cost of Producing
FILBERTS and WALNUTS
in Oregon

A PROGRESS REPORT

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This report is a summary of the costs in 1949 of filbert production for 104 plantings on 93 farms, and of walnut production for 93 plantings on 91 farms in western Oregon.

The purpose of this study was to obtain information from growers that would provide basic facts on yields and on costs of production. This information, when carefully adjusted to reflect changes occurring in yields and in the price level of farm production costs, provides a basis whereby cost of production can be readily estimated for any given year if no changes have occurred in production techniques.2

Part I: Filberts

Costs of production

The cost of producing filberts in 1949 on 2,102 acres, yielding 1,132 pounds of dried nuts (orchard run) per acre, averaged \$163 per acre and 14.4¢ per pound (Table 1). The costs include all items of expense incurred in producing and delivering the nuts to the drier, plus the cost of drying.

Labor. The cost of man labor was \$69.32 per acre, or 42.5 per cent of the total cost of production. The average labor requirement per acre was 79 hours, of which 49 hours or about two-thirds of the total was for harvesting. (The number of hours shown for picking was computed by dividing the cost of picking by 75 cents. The rate for all other labor averaged 99¢ per hour.) The labor costs comprised 6.12¢ per pound of dried nuts.

1 Nut growers and processors requested the Oregon Agricultural Experiment Station to make this cost-of-production study. The data were obtained from representative growers by experienced enumerators, using the survey method. The author is particularly grateful to John H. Painter, Horticulturist, U. S. Department of Agriculture, for rendering valuable service in the field work done.

2 The cost of production reported herein is the average-acre cost of the entire plantings in the study. Thus the man-hours-per-acre (See Table 1) is a figure that is applicable to the entire acreage of filberts in the Willamette Valley. It indicates the average amount of labor that may be required per acre for all of the crop, even though each acre may not have been covered by every operation. The same holds true of the other items of cost.

Table 1. Filbert Production Costs, Willamette Valley, Oregon, 1949

Based on 104 orchards, averaging 20 acres, and producing 1,132 pounds of dried nuts (orchard run) per acre.

Item	Man hours		Cost	
	Number	Percentage of total <u>Per cent</u>	Amount	Percentage of total <u>Per cent</u>
<u>Labor per acre</u>				
Pruning.	3.5	4.4	\$ 3.38	2.1
Brush removal.	1.4	1.8	1.28	.8
Hoeing; suckering.	7.0	8.8	6.55	4.0
Machine cultivating.	5.3	6.7	5.38	3.3
Cover cropping . . . . .	.5	.6	.55	.3
Fertilizing. . . . .	.5	.6	.49	.3
Spraying; dusting.	1.0	1.3	.95	.6
Miscellaneous; supervision	10.9	13.7	11.23	6.9
Total preharvest.	30.1	37.9	29.81	18.3
Picking.	42.9	54.0	33.25	20.4
Other harvest.	6.4	8.1	6.26	3.8
Total labor	79.4	100.0	\$69.32	42.5
<u>Materials per acre</u>				
Fertilizers.			\$ 4.92	3.0
Cover crop seed.			3.81	2.3
Sprays; dust			4.63	2.9
Total materials			\$13.36	8.2
<u>General expense per acre</u>				
Building repair.			\$.60	.4
Machinery repair			4.22	2.6
Drying			12.55	7.7
Gas and oil.			4.44	2.7
Electricity; water; wood fuel; office; supplies.			2.25	1.4
Liability, fire, and motor insurance			1.87	1.1
Property taxes			5.91	3.6
Cash to operate.			6.00	3.7
Total general expenses.			\$37.84	23.2
<u>Depreciation per acre</u>				
Buildings (not including operator's dwelling). .			\$ 2.65	1.6
Machinery.			9.38	5.8
Total depreciation.			\$12.03	7.4
<u>Interest per acre</u>				
Buildings.			\$ 2.99	1.8
Machinery.			3.39	2.1
Orchard.			24.03	14.8
Total interest.			\$30.41	18.7
TOTAL COST PER ACRE			\$162.96	100.0
Cost per pound (orchard run).			14.40¢	

Materials. The cost of cover crop seed and commercial fertilizers used on the filbert orchards studied averaged \$8.73 per acre, or less than a cent per pound of filberts produced. Dust, spray, and bait materials averaged \$4.63 cost per acre.

General expense. The various charges for equipment operation and all miscellaneous expenses averaged \$37.84 per acre, or about one-fourth of the total costs. This item equaled 3.34¢ per pound of filberts produced.

Depreciation on equipment. The depreciation on machinery equipment chargeable to filberts averaged \$9.38 per acre. Depreciation on buildings averaged \$2.65 per acre.

Interest on investment. Interest averaged \$30.41 per acre, or 2.7¢ per pound of filberts. Interest (in lieu of rent) was computed as a cost at 4 per cent on the value of the orchard. Five per cent interest was figured on the investment in buildings and machinery.

Capital investment

The total amount of capital (present value) represented by the 104 filbert plantings in the study averaged \$14,722 per planting (20 acres each), or \$728 per acre (Table 2). These amounts do not include cash required to operate.

Table 2. Filbert Enterprise Investment: Average value of capital invested in 104 plantings studied, Willamette Valley, Oregon, 1949.

Item	Value per planting	Value per acre	Percentage of total
			<u>Per cent</u>
Land	\$ 6,073	\$ 300	41.2
Trees	6,072	300	41.2
Buildings	1,207	60	8.3
Duster; sprayer	115	6	.8
Harvester	226	11	1.5
Other machinery	377	19	2.6
Tractor	389	19	2.6
Automobile; truck	263	13	1.8
Total	\$ 14,722	\$ 728	100.0

The value of the orchards averaged \$600 per acre. The value of comparable land without trees averaged \$300 per acre. These values were estimates by the growers, made from a conservative, long-term standpoint. The figures indicate a value of \$300 per acre for the bearing trees, exclusive of the land.

The present (depreciated) values of buildings and other equipment used in production were allocated proportionately to the various enterprises according to the use made thereof.

Variations in costs of producing filberts

The cost of filbert production per pound in 1949 was more than twice as high on the group of 35 plantings (one-third of the total studied) with the highest costs as it was on the group of 35 plantings with the lowest costs per pound (Table 3). The respective figures were 22.13¢ and 10.98¢ per pound.

Table 3. Filberts: Variations in cost per acre and per pound on the low-cost and the high-cost orchards, Willamette Valley, Oregon, 1949.

Item	All orchards studied	Low-cost orchards	Your orchard	High-cost orchards
Number of orchards	104	35	_____	35
Acres per orchard.	20	21	_____	21
Pounds of filberts per acre.	1,132	1,594	_____	631
Estimated value of orchard per acre.	\$ 600	\$ 593	_____	\$ 581
<u>Cost per acre</u>				
Pruning	\$ 3.38	\$ 3.59	_____	\$ 2.65
Brush disposal.	1.99	1.88	_____	1.98
Hoeing; suckering	6.81	6.90	_____	7.44
Cultivating	12.57	11.12	_____	12.03
Cover cropping.	5.00	3.81	_____	5.59
Fertilizing	5.93	6.20	_____	4.26
Dusting; spraying	7.41	8.20	_____	4.99
Automobile; truck	5.57	5.17	_____	5.82
Buildings	6.23	5.59	_____	6.17
Property taxes.	5.91	6.26	_____	5.77
Cash to operate (5 per cent)*	6.00	6.00	_____	6.00
Miscellaneous labor and expense	16.51	17.18	_____	15.53
Interest on orchard (4 per cent).	24.03	23.72	_____	23.25
Total preharvest cost.	\$107.34	\$105.62	_____	\$101.48
Harvest and drying cost.	55.62	69.44	_____	38.15
Total cost per acre	\$162.96	\$175.06	_____	\$139.63
	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>	<u>Cents</u>
<u>Cost per pound</u>				
Preharvest.	9.48	6.62	_____	16.08
Harvest and drying.	4.92	4.36	_____	6.05
Total cost per pound	14.40	10.98	_____	22.13

* Amount was estimated and applied uniformly over the entire acreage studied.

The average acreages of the plantings in the two groups were the same. The values of the orchards in the monetary sense were quite comparable. Most of the preharvest expenditures differed only slightly on the acre basis, but they differed greatly on the pound basis as the big difference lay in the yield produced per acre--631 pounds for the high-cost group and 1,594 pounds for the low-cost group.

Estimated returns from filberts

The estimated prices paid to growers for their 1949 filberts averaged 11¢ per pound compared to the average cost of 14.4¢ shown in the study. Filbert growers, therefore, recovered only 76 per cent of their total costs (Table 4). How about the crop results for 1948? Crop statisticians estimated that the small crop of 558 pounds per acre brought the growers 13¢ a pound. The estimated cost for the 1948 crop was nearly 26¢ a pound. This means that the growers received only 51 per cent of their total costs that year.

Table 4. Filberts: Estimated cost and the seasonal average price, Oregon.*

Year	Yield per acre	Estimated cost per acre				Cost per pound	Price per pound	Per cent price is of cost
		Labor		Other costs	Total cost			
		Harvest	Other					
	<u>Pounds</u>					<u>Cents</u>	<u>Cents</u>	<u>Per cent</u>
1940...	581	\$ 6	\$ 9	\$48	\$63	10.8	12.0	106
1941...	980	12	10	50	72	7.3	15.0	205
1942...	661	11	14	57	82	12.4	17.3	140
1943...	1,060	28	22	65	115	10.9	25.0	229
1944...	889	27	26	65	118	13.3	27.0	203
1945...	625	20	27	65	112	17.9	27.5	154
1946...	901	30	28	74	132	14.7	19.0	129
1947...	860	29	29	88	146	17.0	12.5	73
1948...	558	19	30	95	144	25.8	13.0	51
1949...	1,132	40	30	93	163	14.4	11.0	76
1950...	643	23	30	93	146	22.7	--	---
<u>Average</u> 1940-49	825	-----				14.4	17.9	124

* Prices and yields are based on Oregon Extension Bulletin 700: OREGON'S TREE FRUITS AND NUTS, and on other data prepared cooperatively by the Oregon State College Extension Service, Agricultural Economics Section, and the Bureau of Agricultural Economics.

In 1947 the yield of 860 pounds per acre brought the growers 12.5¢. The estimated cost for that year was 17¢, giving the growers 73 per cent of their total cost. Thus 1947, 1948, and 1949 proved to be three bad years in succession. However, the preceding seven years, beginning with 1940, were all more or less favorable. The price of filberts for the ten-year period from 1940 to 1949 averaged 17.9¢ and estimated costs averaged 14.4¢. The growers' price differential, therefore, was 124 per cent of the estimated long-term costs.

How long can growers continue if their costs are higher than their prices? That depends! The term cost includes a charge for all items of input. It refers to the cash expenditures for commercial fertilizers, sprays, taxes, interest and hired labor; and also to the value of manure applied, to depreciation, to interest for the investment value represented by the equipment and the orchard, and to a fair wage for work done by the operator and his family. Obviously, to the extent that a grower holds equity in his equipment and orchard, and does his own work, he may defer such costs for awhile.

Part II: Walnuts

Costs of production

The cost of producing walnuts in 1949 on 3,493 acres, yielding 741 pounds of dried nuts (orchard run) per acre, averaged \$117 per acre and 15.77¢ per pound (Table 5). The costs include all items of expense incurred in producing and delivering the nuts to the drier, plus the cost of drying.

Labor. The cost of man labor was \$40.09 per acre, or 34.3 per cent of the total cost of production. The average labor requirement per acre was 45.5 hours, of which 30 hours or about two-thirds of the total was for harvesting. (The number of hours shown for picking was computed by dividing the cost of picking by 75¢. The rate for all other labor averaged \$1.02 per hour.) The labor costs comprised 5.41¢ per pound of dried nuts.

Materials. The cost of cover crop seed and commercial fertilizers used on the walnut orchards studied averaged \$7.29 per acre, or about a cent per pound of walnuts produced. Dust, spray and bait materials averaged \$2.86 cost per acre.

General expense. The various charges for equipment operation and all miscellaneous expenses averaged \$33.33 per acre, or about 4.5¢ per pound of walnuts produced.

Depreciation on equipment. The depreciation on machinery equipment chargeable to walnuts averaged \$6.44 per acre. Depreciation on buildings averaged \$2.30 per acre.

Interest on investment. Interest averaged \$24.62 per acre, or 3 1/3¢ per pound of walnuts. Interest (in lieu of rent) was computed as a cost at 4 per cent on the value of the orchard. Five per cent interest was figured on the investment in buildings and machinery.

Capital investment

The total amount of capital (present value) represented by the 93 walnut plantings in the study averaged \$22,216 per planting (37.5 acres each), or \$592 per acre (Table 6). These amounts do not include cash required to operate.

The value of the orchards averaged \$495 per acre. The value of comparable land without trees averaged \$216 per acre. These values were estimates by the growers made from a conservative, long-term standpoint. The figures indicate a value of \$279 per acre for the bearing trees, exclusive of the land.

The present (depreciated) values of buildings and other equipment used in production were allocated proportionately to the various enterprises according to the use made thereof.

Table 5. Walnut Production Costs, Willamette Valley, Oregon, 1949

Based on 93 orchards, averaging 37.5 acres, and producing 741 pounds of dried nuts (orchard run) per acre.

Item	Man hours		Cost	
	Number	Percentage of total <u>Per cent</u>	Amount	Percentage of total <u>Per cent</u>
<u>Labor per acre</u>				
Pruning.	1.6	3.5	\$ 1.56	1.3
Brush removal. . . . .	.9	2.0	.89	.8
Machine cultivating.	2.9	6.4	2.76	2.4
Cover cropping. . . . .	.4	.9	.44	.4
Fertilizing. . . . .	.4	.9	.41	.3
Spraying; dusting.	1.2	2.6	1.18	1.0
Miscellaneous; supervision	8.2	18.0	8.76	7.5
Total preharvest.	15.6	34.3	16.00	13.7
Picking.	24.5	53.8	18.59	15.9
Other harvest.	5.4	11.9	5.50	4.7
Total labor.	45.5	100.0	\$40.09	34.3
<u>Materials per acre</u>				
Fertilizers.			\$ 4.07	3.5
Cover crop seed.			3.22	2.8
Sprays; dust.			2.86	2.4
Total materials.			\$10.15	8.7
<u>General expense per acre</u>				
Building repair. . . . .			.57	.5
Machinery repair.			3.38	2.9
Drying.			11.69	10.0
Gas and oil.			3.05	2.6
Electricity; water; wood fuel; office; supplies.			2.26	1.9
Liability, fire, and motor insurance.			1.40	1.2
Property taxes.			4.98	4.3
Cash to operate.			6.00	5.1
Total general expenses.			\$33.33	28.5
<u>Depreciation per acre</u>				
Buildings (not including operator's dwelling). .			\$ 2.30	2.0
Machinery.			6.44	5.5
Total depreciation.			\$ 8.74	7.5
<u>Interest per acre</u>				
Buildings.			\$ 2.57	2.2
Machinery.			2.26	1.9
Orchard.			19.79	16.9
Total interest.			\$24.62	21.0
TOTAL COST PER ACRE.			\$116.93	100.0
Cost per pound (orchard run).			15.77¢	

Table 6. Walnut Enterprise Investment: Average value of capital invested in 93 plantings studied, Willamette Valley, Oregon, 1949.

Item	Value per planting	Value per acre	Percentage of total
			<u>Per cent</u>
Land.	\$ 8,126	\$216	36.5
Trees	10,460	279	47.1
Buildings	1,920	51	8.7
Duster; sprayer	186	5	.8
Other machinery	547	15	2.5
Tractor	615	16	2.8
Automobile; truck	362	10	1.6
Total.	\$22,216	\$592	100.0

Variations in costs of producing walnuts

The cost of walnut production per pound in 1949 was almost three times as high on 31 plantings (one-third of the total number studied) with the highest costs per pound as it was on the group of 31 plantings with the lowest costs per pound (Table 7). The respective amounts were 11.48¢ and 34.5¢ per pound.

As was true in the filbert study, there were no significant differences in size of plantings or in most items of preharvest costs per acre. Again, the big difference in costs per pound was due to the yield per acre--226 pounds for the high-cost group and 1,180 pounds for the low-cost group of growers.

Estimated returns from walnuts

The estimated prices paid to growers for their 1949 walnut crop averaged 11¢ per pound. Walnut growers, therefore, recovered only 70 per cent of their total costs (Table 8). How about the crop results for 1947? Crop statisticians estimated that the small crop of 463 pounds per acre brought the growers 15.5¢ a pound. The estimated cost for the 1947 crop was 22¢ a pound. This means that the growers again received only 70 per cent of their total costs that year.

In 1948 the yield of 752 pounds per acre brought the growers 12¢. The estimated cost for that year was 15.8¢, giving the growers 76 per cent of their total cost. Thus 1947, 1948, and 1949 proved to be three bad years in succession. However, the preceding four years, beginning with 1943, were favorable. The price of walnuts for the ten-year period from 1940 to 1949 averaged 16.3¢. Estimated costs averaged 15.3¢ (almost the same cost as our study shows for the year 1949), based on yields averaging 563 pounds per acre. The growers' price differential, therefore, was 107 per cent of the estimated long-term costs.

Cost refers to not only the cash expenditures but also to the noncash items, such as manure applied, depreciation, interest on the investment value of the equipment and orchard, and a fair wage for work of the operator and his family. Thus to the extent that the grower holds equity in his property and does his own work, he may defer some of the latter costs and thereby tide over the years of adverse conditions.

Table 7. Walnuts: Variations in cost per acre and per pound on the low-cost and the high-cost orchards, Oregon, 1949.

Item	All orchards studied	Low-cost orchards	Your orchard	High-cost orchards
Number of orchards	93	31	_____	31
Acres per pound.	37.5	44.5	_____	43.1
Pounds of walnuts per acre	741	1180	_____	226
Estimated value of orchard per acre. .	\$ 495	\$ 457	_____	\$ 442
<u>Cost per acre</u>				
Pruning	\$ 1.56	\$ 1.66	_____	\$ 1.17
Brush disposal.	1.54	1.95	_____	.82
Hoeing; replanting. . . . .	.93	1.10	_____	.58
Cultivating	7.22	6.47	_____	6.36
Cover cropping.	4.19	4.87	_____	3.18
Fertilizing	4.80	5.35	_____	2.27
Dusting; spraying	5.89	6.98	_____	4.25
Automobile and truck.	4.30	4.73	_____	2.95
Buildings	5.43	5.09	_____	4.16
Property taxes.	4.98	5.17	_____	4.44
Cash to operate (5 per cent)*	6.00	6.00	_____	6.00
Miscellaneous labor and expense . . .	12.66	13.25	_____	9.04
Interest on orchard (4 per cent). . .	19.79	18.29	_____	17.67
Total preharvest cost.	\$ 79.29	\$ 80.91	_____	\$ 62.89
Harvest and drying cost.	37.64	54.61	_____	15.04
Total cost per acre	\$116.93	\$135.52	_____	\$ 77.93
<u>Cost per pound</u>				
Preharvest.	10.70	6.86	_____	27.84
Harvest and drying.	5.07	4.62	_____	6.66
Total cost per pound	15.77	11.48	_____	34.50

* Amount was estimated and applied uniformly over the entire acreage studied.

Table 8. Walnuts: Estimated cost and the seasonal average price, Oregon.*

Year	Yield per acre	Estimated cost per acre				Cost per pound	Price per pound	Per cent price is of cost
		Labor		Other costs	Total cost			
		Harvest	Other					
	Pounds				Cents	Cents	Per cent	
1940...	400	\$ 4	\$ 5	\$39	\$ 48	12.0	10.0	83
1941...	622	7	6	42	55	8.8	12.0	136
1942...	314	6	9	48	63	20.1	14.3	71
1943...	455	11	12	51	74	16.3	21.0	129
1944...	574	16	13	53	82	14.3	22.5	157
1945...	575	17	14	55	86	15.0	23.0	153
1946...	735	22	15	61	98	13.3	22.0	165
1947...	463	14	15	73	102	22.0	15.5	70
1948...	752	25	16	78	119	15.8	12.0	76
1949...	741	24	16	77	117	15.8	11.0	70
1950...	500	16	16	80	112	22.4	--	--
Average								
1940-49	563	-----	-----	-----	-----	15.3	16.3	107

* Prices and yields are based on Oregon Extension Bulletin 700: OREGON'S TREE FRUITS AND NUTS, and on other data prepared cooperatively by the Oregon State College Extension Service, Agricultural Economics Section, and the Bureau of Agricultural Economics.