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WALNUT COST & MANAGEMENT STUDY



SAN JOAQUIN COUNTY
1950

COMPILED BY
AGRICULTURAL EXTENSION SERVICE
UNIVERSITY OF CALIFORNIA UC COOPERTIVE EXTENSION

I N T R O D U C T I O N

This report contains a summary of results of the Walnut Management Study conducted in San Joaquin County for the year 1950. This study began in 1949 and is one of several studies being conducted in the various walnut producing areas of the state. Included are fourteen individual records of local walnut growers. One cooperator in the 1949 study is not included in this study, while two growers are participating for the first year. These changes may slightly affect the averages when comparisons are made with the previous year.

The 1950 crop year was again an excellent year. The average yield per acre for orchards in the study was 1966 pounds, compared to 1920 pounds for 1949. Quality was good. The percentage of Diamonds and large nuts averaged higher than the previous year but the proportion which was merchantable was somewhat lower. Average management income for orchards in the study was slightly higher.

The production for San Joaquin County orchards in 1950 was 1360 pounds per acre which is 600 pounds less than the average for orchards in this study. This county figure may not be too accurately compared to the previous year, due to the completion of a new tree to tree survey count of permanent tree crops which was used as a basis for determining the average yield for 1950. It should be pointed out that growers represented in this study are believed to be above average in efficiency of production and they represent only a small segment of the walnut industry of the county. For this reason the figures presented here are not intended to be representative of either the state or county average production costs.

We wish to express our appreciation to the growers participating in the study and to the Linden Walnut Growers Association for their help and cooperation.

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EXPLANATION OF TERMS USED IN THIS REPORT

Labor Costs: Includes hired labor, value of operator's labor at going wage rates and use of tractors and trucks charged at an hourly rate to cover operating and overhead costs. Where contract work is reported, such as for spraying or hulling and dehydrating, overhead costs on equipment and facilities are usually covered.

Material Costs: Includes water costs (pumping power, irrigation district tax, if any, or water purchased), pest and disease control materials, fertilizer and covercrop seed.

Cash Overhead Costs: Includes all cash costs not reported under labor and material costs except interest paid on mortgaged indebtedness. Principal items covered by this classification of costs are general expense, county taxes, compensation and other insurance, and repairs on facilities and equipment other than tractors and trucks. The general expense item is calculated at 5% of total labor and material cost and covers such miscellaneous cash costs as interest on operating capital, office expenses and use of family car in conjunction with the enterprise.

Depreciation: That portion of the original cost of facilities and equipment which is chargeable to current year's operations. Depreciation on tractors and trucks is included in the hourly rate charged in the labor record for their use and, therefore, is excluded from total depreciation costs shown in the tables. Depreciation on trees of \$13.75 per acre is based upon an estimated original cost of establishing the orchard of \$550 per acre and a productive life of 40 years. Tree depreciation was figured the same for all orchards.

Interest on Investment: This cost is computed at 5% of the average value of facilities and equipment. Average values, except for land, are figured at one-half of the original cost or replacement cost as the case may be. Land values are based upon estimated long-term agricultural values. Average tree values were figured the same for all orchards at \$275 (1/2 of \$550 estimated original cost). Interest on investment in tractors and trucks is excluded from the total interest charge in the tables for the reason explained under "Depreciation."

Total Cost: Includes all of the above costs.

Total Income and Average Price All Nuts: Includes total cash returns plus deferred payments such as revolving funds and operating margins or gains.

Management Income: Total income less total cost. If total cost exceeds total income a minus (-) management income is shown.

TABLE 1 - SUMMARY OF COSTS, INCOME AND EARNINGS PER ACRE - 1950

Record Number	Main varieties 1/	Av. age trees	Size of orchard 2/	Yield lbs. per acre	Av. price all nuts	Total income per acre	Costs per Acre					Management income per A.	
							Total labor	Total material	Cash overhead	Depreciation	Interest		Total
1	E	23	A	3145	20.65	649.29	95.81	25.97	26.26	27.09	44.04	219.17	430.12
12	P	31	C	2736	21.29	582.55	124.06	59.72	25.70	23.44	43.70	276.62	305.93
4	G.P.F	24	C	2551	21.48	547.84	107.20	38.94	28.52	32.78	45.35	252.79	295.05
20	P.F	26	A	2223	19.80	440.13	87.45	16.10	23.45	34.13	46.33	207.46	232.67
6	E.F	43	B	2174	20.45	444.78	120.11	31.25	27.46	27.88	41.05	247.75	197.03
7	P.F	27	A	2068	20.82	430.53	107.49	32.98	29.06	31.28	46.47	247.28	183.25
15	P	21	A	2182	20.39	444.88	124.07	55.92	14.79	30.33	42.05	267.16	177.72
16	F	31	C	2023	19.88	402.39	92.76	46.21	23.41	23.44	43.70	229.52	172.87
13	P	33	C	1609	20.51	330.01	74.88	50.29	22.17	36.96	47.89	232.19	97.82
18	M	31	C	1446	18.51	267.64	79.87	22.58	21.43	23.44	43.70	191.02	76.62
8	P.F	27	B	1658	19.44	322.47	125.76	36.36	28.37	23.28	44.64	258.41	64.06
2	P.F.M	25	B	1417	19.54	276.89	92.17	10.36	17.52	49.60	53.55	223.20	53.69
21	F.M		A	967	19.09	184.74	67.03	20.69	18.08	14.75	34.00	154.55	30.19
17	P.F	31	A	1380	19.78	273.02	106.49	53.67	14.99	32.67	43.96	251.78	21.24
Av.1950	-	30	-	1966	20.26	398.32	98.61	39.00	23.65	28.37	44.85	234.48	163.84
Av.1949	-	29	-	1920	20.11	386.23	101.17	43.93	22.97	28.56	44.82	241.45	144.78

1/ F= Franquettes; P= Paynes; M= Mayettes; E= Eureka; G= Groves

2/ A= under 40 acres; B= 40-100 acres; C= over 100 acres

In all tables of this report the individual records are arranged downwards in order of decreasing management income per acre. Total costs in the above table ranged from about \$155 to \$277 per acre. Noticeable is the fact that low costs are not the major factor relative to high management incomes. Of particular interest is the fact that orchards in the study, with yields under 1700 pounds per acre, averaged a management income of less than \$100 per acre.

Management income in 1950 averaged nearly \$20 per acre more than in 1949 for orchards in the study. Income was up slightly and labor costs were a bit lower. The lower costs per acre compared to the 1949 study is not significant. The orchard with the highest cost per acre in the 1949 study is not included in the 1950 study and two orchards, records 20 and 21 with lower than average costs, were not in the 1949 study.

TABLE 2 - SUMMARY OF COSTS, INCOME AND EARNINGS PER HUNDREDWEIGHT - 1950

Record Number	Yield, lbs. per acre	Costs per Hundredweight									Av. price merchantable	Av. price all nuts	Management income per cwt.
		Knock, pick, haul out	Hull, dry, del.	Total harvest	Cul-tural labor	Cul-tural mater ¹ l	Cash over-head	Depre-ciation	Inter-est	Total cost			
1	3145	2.01	.34	2.35	.70	.82	.84	.86	1.40	6.97	22.27	20.65	13.68
12	2736	2.49	.40	2.89	1.64	2.18	.94	.86	1.60	10.11	22.81	21.29	11.18
4	2551	2.77	.40	3.17	1.03	1.53	1.12	1.28	1.78	9.91	22.56	21.48	11.57
20	2223	2.48	.46	2.94	.99	.73	1.05	1.54	2.08	9.33	21.25	19.80	10.47
6	2174	3.19	.45	3.64	1.88	1.44	1.26	1.28	1.89	11.39	21.72	20.45	9.06
7	2068	2.89	.46	3.35	1.85	1.59	1.41	1.51	2.25	11.96	21.85	20.82	8.86
15	2182	3.05	.55	3.60	2.09	2.56	.68	1.39	1.92	12.24	21.48	20.39	8.15
16	2023	2.91	.40	3.31	1.28	2.28	1.15	1.16	2.16	11.34	21.14	19.88	8.54
13	1609	2.52	.57	3.09	1.56	3.13	1.38	2.29	2.98	14.43	21.39	20.51	6.08
18	1446	3.27	.49	3.76	1.76	1.56	1.49	1.62	3.02	13.21	22.90	18.51	5.30
8	1658	3.33	.63	3.96	3.63	2.19	1.71	1.40	2.69	15.58	20.69	19.44	3.86
2	1417	3.40	.75	4.15	2.35	.73	1.24	3.50	3.78	15.75	21.68	19.54	3.79
21	967	3.81	1.57	5.38	1.55	2.14	1.87	1.52	3.51	15.97	22.10	19.09	3.12
17	1380	3.34	.65	3.99	3.72	3.89	1.09	2.37	3.18	18.24	21.06	19.78	1.54
Av.1950	1966	2.87	.48	3.35	1.67	1.98	1.20	1.44	2.28	11.92	21.92	20.26	8.34
Av.1949	1920	2.87	.66	3.53	1.73	2.29	1.20	1.49	2.33	12.57	21.38	20.11	7.54

It is noticeable in this table that high yields are one of the most important factors influencing costs per pound. Yields ranged from 967 to 3145 pounds per acre and costs of production ranged from 7 cents to 18 cents per pound. With few exceptions the higher yielding orchards had lower costs per hundredweight.

Total costs of production this year averaged about 1/2 cent per pound lower than in 1949, due to a slightly higher yield and slightly lower costs per acre. Knocking, picking and hauling-out costs per hundredweight averaged the same this year as in 1949 but hulling and drying were slightly lower.

Overhead costs of interest and depreciation on harvesting equipment for those owning such equipment is not included in the harvesting cost figures in this table. Depreciation and investment is shown in Tables 6 and 7. Repairs shown under cash overhead in Table 6 include any repairs on harvesting equipment.

Quality of nuts produced affects the price received. (See Table 3)

TABLE 3 - GRADE AND SIZE DISTRIBUTION, AVERAGE FOR ALL VARIETIES - 1950

Record Number	Merchantable Grades - Percent of Total Yield						Per cent orchard run	Per cent culls <u>2/</u>	Per cent blows	Percent of Merchantable		
	Diamond		Emerald		All merch- babies	Total merch- antable				Large	Medium	Small
	Large	Medium	Large <u>1/</u>	Medium <u>1/</u>								
1	25.1	5.8	44.2	8.7	2.3	86.1	-	11.3	2.6	80.4	17.0	2.6
12	64.7	12.3	1.2	-	5.7	83.9	-	16.1	-	78.5	14.6	6.9
4	72.1	8.9	4.7	.5	3.8	90.0	-	9.0	1.0	85.3	10.4	4.3
20	34.8	21.6	12.6	2.3	14.6	85.9	-	11.9	2.2	55.2	27.8	17.0
6	25.0	18.4	17.6	11.5	15.5	88.0	-	10.9	1.1	48.4	34.0	17.6
7	36.5	12.7	20.3	7.1	13.4	90.0	-	8.4	1.6	63.0	22.0	15.0
15	37.1	19.1	10.8	5.4	17.3	89.7	-	8.6	1.7	53.4	27.3	19.3
16	18.7	33.5	14.3	-	18.7	85.2	-	14.8	-	38.8	39.3	21.9
13	44.6	19.9	10.7	3.9	12.0	91.1	-	7.8	1.1	60.7	26.1	13.2
18	53.2	-	-	-	-	53.2	21.9	24.9	-	100.0	-	-
8	28.1	12.6	17.3	8.9	20.3	87.2	.6	10.1	2.1	52.1	24.6	23.3
2	36.1	8.4	21.8	5.3	8.5	80.1	-	16.8	3.1	72.3	17.1	10.6
21	44.8	4.0	15.5	3.7	4.4	72.4	3.8	19.5	4.3	83.2	10.7	6.1
17	-	-	59.9	17.9	10.7	88.5	-	8.8	2.7	67.7	20.2	12.1
Av.1950	43.7	15.4	10.5	2.6	10.1	82.3	2.9	14.0	.8	65.9	21.9	12.2
Av.1949	32.6	20.3	12.5	5.3	19.0	89.7	-	10.3*	-	50.2	28.6	21.2

1/ Includes any Suntand quality

2/ Includes any wormy culls

* Includes blows

All orchards in the study were members of the Walnut Growers Association, which made it possible to obtain comparable grades and sizes for all records.

In the above table, grade and size distribution varied a great deal between orchards in the study. Those with higher percentages of Diamonds and large sizes averaged higher returns for merchantable nuts as seen in Table 2. The difference between the lowest and highest average price received for merchantable nuts was more than 2 cents per pound.

The difference between the average price received for merchantable and for all nuts depended on the proportion of orchard run, culls and blows. The average price for all nuts ranged from about 18½ cents to 21 cents per pound. Record Number 18 had the highest average price for merchantable but also the lowest average price for all nuts, due to the large proportion of orchard run and culls.

The percentage of Diamonds and large averaged higher in 1950 than in 1949 for those in the study. However, the proportion which was merchantable was about 7½ per cent lower.

TABLE 4 - VARIETY YIELDS AND SIZE DISTRIBUTION - 1950

Record Number	Franquette			Payne			Other Varieties 2/		
	Yield, lbs. per acre <u>1/</u>	Percent of Merchantable		Yield lbs. per acre <u>1/</u>	Percent of Merchantable		Yield lbs. per acre <u>1/</u>	Percent of Merchantable	
		Large	Medium		Large	Medium		Large	Medium
1	-	-	-	-	-	-	3145 E	80.4	17.0
12	-	-	-	2736	78.5	14.6	-	-	-
4	2023	82.0	12.9	3086	86.4	9.0	2548 G	85.8	10.3
20	2437	51.9	32.1	2011	55.6	25.2	-	-	-
6	1839	31.6	38.0	-	-	-	2258 E	51.8	33.1
7	1599	42.0	32.8	2175	66.3	20.4	-	-	-
15	-	-	-	2182	53.4	27.3	-	-	-
16	2023	38.8	39.3	-	-	-	-	-	-
13	-	-	-	1609	60.7	26.1	-	-	-
18	-	-	-	-	-	-	1446 M	100	-
8	2466	21.8	33.9	1389	70.5	19.0	-	-	-
2	979	68.0	20.6	1772	71.3	17.4	664 M	89.3	7.6
21	981	73.7	16.6	-	-	-	954 M	96.5	2.5
17	1564	47.4	33.3	1360	73.2	16.7	-	-	-
Av.1950	1907	42.3	35.6	2133	71.8	18.3	1793	83.1	12.2
Av.1949	1724	24.0	42.0	2280	47.8	29.5	1546	82.9	12.9

1/ Total nuts delivered

2/ E= Eureka; G= Grove; M= Mayette

A comparison of the 1950 average yields for the two principal varieties in this study shows that Paynes again out-yielded Franquettes. However, the difference was not as great as in 1949. In some orchards with both varieties Franquettes showed heavier production this year than Paynes, which was not the case in 1949. It is significant that Paynes continued to show a higher percentage of large nuts this year.

Care should be taken in drawing conclusions from the relatively small number of orchards involved and because of the fact that only two years of production are considered.

TABLE 5 - LABOR AND MATERIAL COSTS PER ACRE - 1950

Record Number	Prune & brush disposal	Fertilizer & cover crop		Spraying, dust & smoke		Cultivate, hoe & weed spray	Irrigation		Frost protection L. & M.	Misc. Labor & material	Total cultural L. & M.	Knock, pick, haul out	Hull, dry, deliver	Total labor & material
		Labor	Material	Labor	Material		Labor	Water (power, tax)						
1	3.63	3.38	16.45	1.82	.49	11.98	1.13	9.03	-	-	47.91	63.16	10.71	121.78
12	8.06	2.49	38.91	9.89	12.94	14.40	6.81	6.89	2.18	2.07	104.64	68.15	10.99	183.78
4	5.73	.97	22.03	-	-	12.50	4.98	16.91	-	2.10	65.22	70.68	10.24	146.14
20	.08	4.80	6.40	5.12	4.67	10.24	1.80	5.03	-	-	38.14	55.24	10.17	103.55
6	6.70	.59	19.57	4.20	3.67	16.15	7.02	7.07	-	7.14	72.11	69.50	9.75	151.36
7	-	2.03	17.20	4.04	6.69	14.16	13.11	5.25	-	8.75	71.23	59.73	9.51	140.47
15	9.13	2.32	37.55	11.67	12.92	14.63	4.30	5.45	3.15	.27	101.39	66.69	11.91	179.99
16	7.21	1.57	39.63	.05	-	8.91	7.07	6.08	-	1.52	72.04	58.78	8.15	138.97
13	.88	1.63	25.78	5.50	19.11	12.77	3.65	5.06	-	1.01	75.39	40.61	9.17	125.17
18	7.26	1.52	15.22	-	-	8.96	6.72	7.08	-	1.30	48.06	47.32	7.07	102.45
8	5.00	1.87	9.94	9.18	19.36	25.45	13.62	6.24	-	5.82	96.48	55.17	10.47	162.12
2	7.69	-	-	2.63	5.70	12.48	7.10	3.90	2.55	1.68	43.73	48.21	10.59	102.53
21	2.24	1.93	5.24	-	-	6.28	4.59	15.45	-	-	35.73	36.85	15.14	87.72
17	7.32	1.73	38.57	6.37	7.39	26.17	5.33	7.71	4.43	-	105.02	46.21	8.93	160.16
Av. 1950	6.13	1.72	26.29	4.98	9.10	12.72	6.69	7.30	2.51	2.33	71.83	56.43	9.35	137.61
Av. 1949	5.48	1.55	30.51	8.32	12.67	12.71	6.94	7.04	1.35	5.32	77.26	55.20	12.64	145.10

The above table is primarily for use of the cooperators in the study in comparing their operational costs with others. The wide variation between some of the orchards in certain costs indicates that there may be opportunities for some operators to make adjustments in practices which may result in lower costs. Particularly noticeable is an operation such as cultivation where costs vary from \$26.17 to a low of \$6.28 per acre. High costs for such an operation do not appear to be indicative of high yields or income. It should be taken into account that some operations, such as pruning and brush disposal, cover-cropping, etc., are often reduced or omitted some years which helps account for the range in costs for these operations. For such operations the costs for an individual orchard on a given year may not be representative of this operation over a period of years.

Average operational costs for all orchards are based upon the acreage on which such operations were performed. Since all orchards did not show costs for all operations, the average total cultural labor and material cost is less than a sum of the various items.

TABLE 6 - CASH OVERHEAD AND DEPRECIATION COSTS PER ACRE - 1950

Record Number	Cash Overhead Costs per Acre					Depreciation Costs per Acre								
	General Expense	County Taxes	Repairs <u>1/</u>	Insurance & other	Total cash overhead	Trees	Buildings	Irrigation	Tillage equipment	Spray & dust eqt.	Harvest eqt.	Hull & dry eqt.	Misc. equipment	Total
1	6.09	9.27	9.20	1.70	26.26	13.75	-	-	.84	-	5.04	7.06	.40	27.09
12	9.19	10.20	4.24	2.07	25.70	13.75	.71	2.34	1.75	.53	.42	2.37	1.57	23.44
4	7.31	11.18	8.18	1.85	28.52	13.75	-	.63	1.77	-	2.29	12.65	1.69	32.78
20	5.17	10.50	6.00	1.78	23.45	13.75	3.00	2.89	1.80	-	7.69	2.08	2.92	34.13
6	7.57	12.21	4.70	2.98	27.46	13.75	1.92	4.83	.60	-	1.49	3.92	1.37	27.88
7	7.02	9.97	9.24	2.83	29.06	13.75	1.08	5.21	1.52	2.01	1.48	5.42	.81	31.28
15	9.00	4.22	-	1.57	14.79	13.75	.92	2.87	1.10	1.92	.75	4.06	4.96	30.33
16	6.95	10.20	4.56	1.70	23.41	13.75	.71	2.34	1.75	.53	.42	2.37	1.57	23.44
13	6.26	8.47	5.62	1.82	22.17	13.75	2.33	3.94	2.71	1.79	5.61	6.39	.44	36.96
18	5.12	10.20	4.70	1.41	21.43	13.75	.71	2.34	1.75	.53	.42	2.37	1.57	23.44
8	8.11	8.95	8.44	2.87	28.37	13.75	.50	2.38	.80	1.44	.24	3.50	.67	23.28
2	5.13	8.31	2.61	1.47	17.52	13.75	.98	3.13	1.48	4.83	2.89	16.42	6.12	49.60
21	4.39	12.11	1.03	.55	18.08	13.75	-	1.00	-	-	-	-	-	14.75
17	8.01	5.41	-	1.57	14.99	13.75	.92	4.84	1.10	1.92	.75	4.06	5.33	32.67
Av.1950	6.88	9.77	5.13	1.87	23.65	13.75	1.05	2.66	1.68	1.24	1.62	5.11	1.79	28.37
-Av.1949	7.26	8.46	5.58	1.67	22.97	13.75	1.25	2.68	1.69	1.28	1.47	5.15	1.68	28.56

1/ Excludes repairs on tractors and trucks since these are included in the hourly rate charged for the use of this equipment in the labor cost.

For a discussion of cash overhead and depreciation costs, tree values and general expense see page on "Explanation of Terms."

Total cash overhead cost ranged from \$14.79 for Record Number 15 to \$29.06 for Record Number 7. The average total cash overhead cost for all orchards of \$23.65 per acre was approximately 10% of the total cost of production.

Depreciation costs vary according to the facilities and equipment of the different operators. Higher depreciation costs do not necessarily mean higher total costs of production, since greater investment in labor-saving equipment may be more than offset by reduced labor costs.

Average total depreciation cost per acre for all orchards is less than a sum of the averages for the various items, since all records did not report costs for all items.

TABLE 7 - AVERAGE INVESTMENT PER ACRE - 1950

Record Number	Trees	Buildings	Irrigation facilities	Tillage equipment	Spray, dust & smoke eqt.	Harvesting equipment	Hull, & dry equipment	Misc. Equipment	Land	Total except tractors & trucks
1	275.00	-	-	4.20	-	24.73	74.86	2.00	500.00	880.79
12	275.00	11.23	35.20	9.39	4.00	2.43	23.86	12.92	500.00	874.03
4	275.00	-	9.35	8.86	-	9.63	95.79	8.47	500.00	907.10
20	275.00	30.00	36.56	11.00	-	34.52	19.34	20.19	500.00	926.61
6	275.00	19.17	26.55	3.00	-	8.25	27.92	11.03	450.00	820.92
7	275.00	12.16	62.57	7.62	15.12	2.78	50.00	4.05	500.00	929.30
15	275.00	18.46	35.07	8.10	17.31	5.11	47.78	34.17	400.00	841.00
16	275.00	11.23	35.20	9.39	4.00	2.43	23.86	12.92	500.00	874.03
13	275.00	31.68	41.42	11.13	9.12	29.93	57.30	2.19	500.00	957.77
18	275.00	11.23	35.20	9.39	4.00	2.43	23.86	12.92	500.00	874.03
8	275.00	12.50	25.63	6.56	17.50	.59	53.13	2.00	500.00	892.91
2	275.00	16.22	47.58	10.27	24.17	10.64	146.00	41.13	500.00	1071.01
21	275.00	-	5.00	-	-	-	-	-	400.00	680.00
17	275.00	18.46	69.63	8.10	17.31	5.11	47.78	37.84	400.00	879.23
Av.1950	275.00	15.50	33.93	8.91	8.44	7.95	47.24	13.28	492.26	897.08
Av.1949	275.00	20.23	34.13	8.88	9.01	7.53	46.94	12.13	486.75	896.44

Investment varied a great deal between operators in this study, as will be noted in Table 7. High investments in certain facilities and equipment do not always reflect higher production costs, as pointed out in Table 6, since interest and depreciation costs for such may be more than offset by reduced labor costs. The total average investment figures shown in the extreme right column of this table exclude tractors and trucks, since the overhead on these is included in the hourly rate charged for the use of this equipment in the labor cost. The average investment figures shown in this table are not intended to be representative of current values, since all items except land are based upon one-half of the original cost, and land values are considered to be long-term agricultural values. Average investment figures in this study have been set up for the purpose of arriving at a conservative interest on investment charge for the use of capital as part of the total cost of production. Average total investment per acre for all orchards is less than a sum of the various items, since all records did not report costs for all items. For an explanation of tree values and depreciation see the page on "Explanation of Terms."