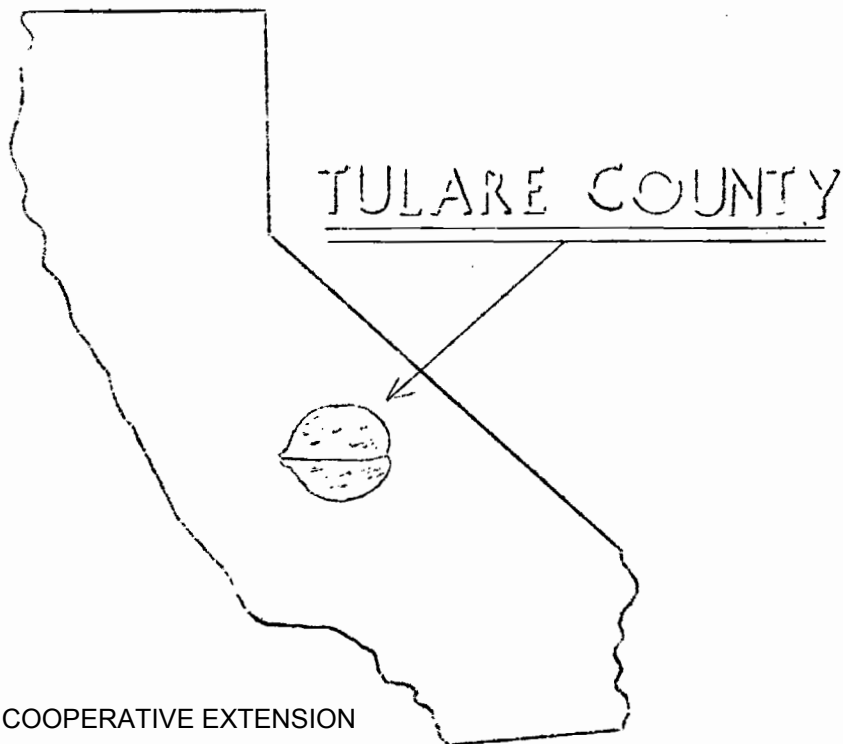


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FIRST ANNUAL WALNUT

MANAGEMENT STUDY



UC COOPERATIVE EXTENSION

AGRICULTURAL EXTENSION SERVICE - TULARE COUNTY
University of California
U.S. Department of Agriculture
by

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TULARE

WALNUT STUDY

INTRODUCTION



During the 1949 crop year, a group of local walnut growers together with the California Walnut Growers Association cooperated with the Agricultural Extension Service in conducting a Walnut Management Study in Tulare County. The results of the first year of the study are presented in this report. Average cost figures for all orchards in the study are not intended to be representative of the industry in the county, because of the relatively small number of records involved and the fact that participating growers are believed to be above average in efficiency of production.

The purpose of this study is to develop current information on the most efficient methods of walnut production in Tulare County and also to provide economic information for use by the industry. It is designed to help individual cooperators, as well as other growers, increase their net earnings through improved management practices. Each cooperator can compare his costs and practices with others in the study and thus has an opportunity to see where adjustments might be made in his operations which would lead to more efficient production.

This study shows wide variations between individual growers in costs and practices. Total cost of production for the 9 orchards ranged from a little over 10 cents per pound to approximately 22½ cents per pound, on the basis of total delivered nuts. Average cost for all orchards was 14.9 cents. Costs based on just merchantable nuts averaged 17.4 cents. Yield per acre appears as the most important factor affecting cost per hundredweight.

Grower returns were not complete at the time the study was summarized and, therefore, income data are excluded from this report. However, an analysis of size and quality of nuts produced, as shown in table 2, indicates that average prices received by various growers would vary considerably.

According to the Agricultural Crop Report for 1949 in Tulare County, published by the Agricultural Commissioner's office, the bearing acreage of walnuts was 3,754 acres and 2,372 acres of nonbearing trees, giving a total of 6,126 acres of walnuts in the county. Yield for the county was 3,036 tons which were valued at \$1,215,586. The large number of acres not yet in bearing indicates the growing interest in the culture of this crop.

Tulare County is fortunate in not having some of the insect pests which are damaging to walnuts in some of the other walnut growing areas. As yet local growers have had no trouble from codling moth, walnut husk fly or navel orangeworms. The two most serious insect pests in this area are aphids and spider mites. Aphid control is probably more generally necessary in the county than mite control. However, the mites do considerably more damage where they occur than does aphids.

The outstanding concern of walnut growers in Tulare County at present is the great damage done by the fungus-caused walnut branch wilt. Each season this disease takes a very heavy toll of fruiting wood and scaffold branches. The University of California at Davis started control studies on this disease in 1945 and has many tests in progress at present. Briefly stated, it appears that anything which reduces the vitality of the trees may be responsible for causing an increase in branch wilt infections.

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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 cost (pumping power, irrigation district tax, if any, or water purchased), pest and disease control materials, fertilizer and cover crop 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 ($\frac{1}{2}$ 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."

WALNUT MANAGEMENT STUDY

In table 1, as well as succeeding tables, records are arranged from left to right in order of decreasing total cost of production per hundredweight based upon the total delivered nuts. It will be noted that costs range from a little over 10 cents for No. 3 to over 22½ cents for Nos. 6 and 1. All orchards in the study averaged a total cost of approximately 15 cents per pound. If total costs were based upon the merchantable nuts only, the average total cost for all orchards would be 17.4 cents per pound.

This table shows a definite relationship between yield and cost of production per hundredweight. In general, the higher yielding orchards showed lower costs than those with lower yields. Although low cost of production is essential to profitable operation, consideration must also be given to the size and quality of the nuts which are produced, since they in turn are reflected in income. Table 2 gives an analysis of size and quality factors. In this table it will be noted that Orchard No. 10 with a higher yield and lower cost than Orchard No. 9 had a much lower percentage of large and medium sized nuts as compared to Orchard No. 9. If income data were available, in all probability Orchard No. 9 would show more profit than Orchard No. 10, even though Orchard No. 10 had lower costs.

Table 1 General Summary of Costs per Hundredweight and per Acre - Individual Orchards - 1949.

Orchard number	3	10	9	7	2	5	4	6	1	Av. All
Principal varieties <u>1/</u>	F,M	F	P,E	P	F,M,P	F	F	M	F	
Average age of trees	27	21	9	9	28	16	15	14	30	22
Number of acres	54.0	20.0	18.0	20.0	60.0	40.0	2.0	17.0	50.0	281.0
Total yield, pounds per acre <u>2/</u>	2447	2316	1919	1463	1009	1242	1049	933	930	1484
<u>Costs per Hundredweight:</u>										
Knock, pick & haul out	\$3.21	\$3.36	\$3.03	\$2.37	\$4.42	\$4.96	\$3.10	\$4.33	\$4.01	\$3.67
Hull, dry and deliver	.56	.49	1.25	1.20	.54	.93	.60	.63	1.58	.81
Total harvest	3.77	3.85	4.28	3.57	4.96	5.89	3.70	4.96	5.59	4.48
Cultural labor	1.48	2.53	2.25	2.77	4.65	3.77	5.74	4.67	4.74	2.99
Cultural material	1.33	1.31	2.02	1.45	.87	2.26	3.12	2.46	2.68	1.64
Cash overhead	1.02	1.09	1.07	1.12	2.28	1.71	3.19	3.22	2.42	1.55
Depreciation	1.06	1.45	.91	1.29	2.20	2.03	2.16	3.18	3.02	1.69
Interest	1.60	1.79	1.86	2.43	3.69	3.07	3.58	4.05	4.24	2.58
Total cost per cwt.	10.26	12.02	12.39	12.63	18.65	18.73	21.49	22.54	22.69	14.93
<u>Costs per Acre:</u>										
Total labor	\$128.41	\$147.51	\$125.28	\$92.78	\$97.03	\$120.00	\$99.00	\$89.83	\$96.05	\$110.83
Total material	32.48	30.41	38.72	21.26	8.72	28.07	32.69	22.93	24.86	24.30
Cash overhead	24.97	25.34	20.53	16.40	23.06	21.17	33.50	30.02	22.54	23.09
Depreciation	25.93	33.64	17.43	18.82	22.18	25.20	22.64	29.68	28.06	25.11
Interest on investment	39.28	41.42	35.76	35.64	37.24	38.16	37.49	37.83	39.40	38.27
Total cost per acre	\$251.07	\$278.32	\$237.72	\$184.90	\$188.23	\$232.60	\$225.32	\$210.29	\$210.91	\$221.60

1/ F = Franquette; M = Mayette; P = Payne; E = Eureka.

2/ Total nuts delivered including culls and blows. Basis of calculating costs per hundredweight. UC COOPERATIVE EXTENSION

Table 2

Variety Yields, Grade and Size Distribution in Individual Orchards - 1949

Orchard number	3	10	9	7	2	5	4	6	1	Av. All
Franquette yield, lbs. per acre <u>1/</u>	2434	2316			1479	1242	1049		930	1547
% of merchantable, large	40.0	28.6			6.9	49.2	10.5		6.0	31.3
% of merchantable, medium	29.7	31.5			9.6	27.7	31.0		17.1	26.3
Mayette(M) & Eureka(E) lbs. per A. <u>1/</u>	M2467		E2519		M770			M933		M1242
% of merchantable, large	69.9		41.7		39.7			63.8		58.9
% of merchantable, medium	16.0		42.2		28.6			20.5		21.0
Payne yield, lbs. per acre <u>1/</u>			1688	1463	1671					1577
% of merchantable, large			51.2	52.0	29.6					46.7
% of merchantable, medium			32.0	28.6	37.9					31.8
<u>Grade and Size Distribution: 2/</u>										
Per cent Diamond large	32.5	26.2	42.6	13.6	19.8	23.2	9.0	59.4	3.2	26.0
Per cent Diamond medium	18.8	28.9	31.6	7.7	15.5	12.1	26.5	19.0	6.7	17.6
Per cent Total Diamond	51.3	55.1	74.2	21.3	35.3	35.3	35.5	78.4	9.9	43.6
Per cent Emerald large <u>3/</u>	7.8			35.2	3.6	20.9			2.1	8.2
Per cent Emerald medium <u>3/</u>	1.7			19.1	6.2	12.6			8.4	5.2
Per cent Emerald babies <u>4/</u>	20.3	36.6	14.7	18.2	33.9	20.7	50.0	14.6	67.9	28.8
Per cent Total Emerald	29.8	36.6	14.7	72.5	43.7	54.2	50.0	14.6	78.4	42.2
Per cent merchantable	81.1	91.7	88.9	93.8	79.0	89.5	85.5	93.0	88.3	85.8
Per cent culls and blows	18.9	8.3	11.1	6.2	21.0	10.5	14.5	7.0	11.7	14.2
Per cent of merchantable, large	49.8	28.6	47.9	52.0	29.7	49.2	10.5	63.8	6.0	39.9
Per cent of merchantable, medium	25.3	31.5	35.6	28.6	27.4	27.7	31.0	20.5	17.1	26.6
Per cent of merchantable, babies	24.9	39.9	16.5	19.4	42.9	23.1	58.5	15.7	76.9	33.5

1/Total nuts delivered. 2/ Average of all varieties in orchards.

3/Includes any Suntan quality. 4/Includes all merchantable babies.

A partial analysis of variety yields and sizes is shown in table 2 along with the grade and sized distribution for all nuts in each of the orchards of the study. Since the number of records involved is relatively small, no conclusions should be drawn as to the relative yields and sizes of the different varieties. Only one orchard had the Eureka variety and this is shown on the lines for Mayettes, since this orchard did not have any of the Mayette variety.

Considerable variation between orchards will be noted in grades and sizes. Orchards Nos. 10, 2, 4, and 1 had relatively high proportions of babies which would reflect lower average prices for all delivered nuts in these orchards. Indications are that Mayettes perhaps crack more than some of the other varieties during the hulling process or handling and thus often show a higher percentage of culls. This probably accounts for the higher percentage of culls and blows for Nos. 3 and 2.

Table 3 is designed primarily for use by 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 would result in lower costs and thus increased profits. 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.

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Table 3 Labor and Material Costs per Acre - Individual Orchards - 1949.

Orchard number	3	10	9	7	2	5	4	6	1	Av. All
Pruning	\$3.18	\$9.10	\$3.78	\$2.00	\$4.85	\$4.74	\$18.00	\$2.12	\$8.64	\$5.15
Brush disposal	1.81	8.40	2.42	1.37	4.49	3.05	5.75	3.29	5.12	3.74
Fertilizing & plant cover crop	1.53	1.08	1.08		.59	4.09	2.15	2.06	3.41	2.04
Fertilizer & cover crop seed	25.28	22.20	31.61	12.56	3.50	15.08	25.60	15.24	20.92	18.39
Spray and dust labor	1.53	3.00	1.50	1.50	.80					1.44
Spray and dust material	2.54	2.50	2.95	3.10	1.10					2.14
Disease cont. hand work, L. & Mat.	1.86				1.48					1.66
Cultivation, hoe, weed spray	18.74	24.17	16.22	16.97	22.26	11.78	13.65	21.36	20.71	19.05
Irrigation labor	6.33	11.90	18.14	18.28	12.35	22.94	20.70	14.59	6.00	12.53
Water cost (power, etc.)	4.20	5.44	4.16	5.60	3.33	12.99	7.09	6.50	2.84	5.37
Miscellaneous labor	1.63	1.09		.42	.27	.28		.13	.20	.61
Miscellaneous material	.14				.64			1.19	1.10	.67
Total cultural labor & material	68.77	88.88	81.86	61.80	55.66	74.95	92.94	66.48	68.94	68.69
Knock, pick and haul out	78.48	77.73	58.16	34.74	44.66	61.69	32.50	40.47	37.28	54.44
Hull, dry and deliver	13.64	11.31	23.98	17.50	5.43	11.43	6.25	5.81	14.69	12.00
Total labor and material cost	\$160.89	\$177.92	\$164.00	\$114.04	\$105.75	\$148.07	\$131.69	\$112.76	\$120.91	\$135.13

In table 4 average total cash overhead, as well as total depreciation and investment figures, are less than a sum of the averages for the various items, since all records did not report costs for all items. For an explanation of general expense and other cash overhead costs see the page on "Explanation of Terms." Also, see the page on "Explanation of Terms" for a discussion of tree values and depreciation costs. The average investment figures shown in this table are not intended to be representative of current values, since on all items except land they are based upon one-half of the original cost and land values are considered to be long-term agricultural values.

Table 4 Cash Overhead, Depreciation and Investment per Acre - 1949 UC COOPERATIVE EXTENSION

Orchard number	3	10	9	7	2	5	4	6	1	Av. All
<u>Cash Overhead Costs per Acre:</u>										
General expense	\$8.04	\$8.90	\$8.20	\$5.70	\$5.29	\$7.40	\$6.58	\$5.63	\$6.05	\$6.76
County taxes	12.98	13.02	10.38	9.85	13.93	7.50	25.42	19.13	9.56	11.87
Repairs, except tractors & trucks	2.22	.50			2.09	4.89	1.00	4.27	4.93	3.18
Insurance and other	1.73	2.92	1.95	.85	1.75	1.38	.50	.99	2.00	1.71
Total cash overhead	24.97	25.34	20.53	16.40	23.06	21.17	33.50	30.02	22.54	23.09
<u>Depreciation Costs per Acre:</u>										
Trees	\$13.75	\$13.75	\$13.75	\$13.75	\$13.75	\$13.75	\$13.75	\$13.75	\$13.75	\$13.75
Buildings	1.85	.83			.83	1.97	1.00	.63	1.00	1.27
Irrigation facilities	4.38	2.76	3.68	2.24	1.95	6.42	2.38	3.67	2.22	3.40
Tillage equipment	1.65	2.68			.85	.55	.64	2.02	.99	1.24
Spray & dust equipment									.75	.75
Harvesting equipment	1.39	4.68		1.86	2.62	.84	3.50	4.46	4.60	4.35
Hulling & drying equipment	2.71	5.42			1.02	1.00	1.00	4.11	3.64	2.51
Miscellaneous equipment	.20	3.52		.97	1.16	.67	.37	1.04	1.11	1.03
Total depreciation	25.93	33.64	17.43	18.82	22.18	25.20	22.64	29.68	28.06	25.11
<u>Average Investment per Acre:</u>										
Trees	\$275.00	\$275.00	\$275.00	\$275.00	\$275.00	\$275.00	\$275.00	\$275.00	\$275.00	\$275.00
Buildings	27.78	12.50			16.67	33.10	15.00	12.50	15.00	20.85
Irrigation facilities	43.52	33.88	40.28	33.62	22.66	83.75	35.71	42.38	29.69	40.61
Tillage equipment	8.24	13.41			5.12	4.08	5.92	15.15	7.39	7.50
Spray & dust equipment									3.75	3.75
Harvesting equipment	3.47	8.25		2.38	5.32	3.94	5.50	22.53	11.50	11.32
Hulling & drying equipment	26.48	62.50			10.12	7.50	10.00	32.11	40.00	25.32
Miscellaneous equipment	1.02	22.82		1.75	10.00	5.83	2.63	6.88	5.56	6.77
Land	400.00	400.00	400.00	400.00	400.00	350.00	400.00	350.00	400.00	389.86
Total investment, excluding tractors and trucks	\$785.51	\$828.36	\$715.28	\$712.75	\$744.89	\$763.20	\$749.76	\$756.55	\$787.89	\$765.45