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First Annual Summary of WALNUT EFFICIENCY STUDY for Stanislaus County

1931

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Compiled by
AGRICULTURAL EXTENSION SERVICE
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FIRST ANNUAL STANISLAUS COUNTY WALNUT EFFICIENCY STUDY

Fourteen bearing walnut groves covering 415.85 acres in Stanislaus County completed the first-year cost of production records ending January 1, 1932. These groves were located in various sections of the county. Most of the acreage, however, was located along the river-bottom lands of the Tuolumne River. Districts represented in the county were Roberts Ferry, Waterford, Empire, Hughson, Modesto, Salida, and Crows Landing.

The data secured from these records show a variation in yields as to variety and also a difference in quality. As every walnut grower knows, the 1931 season was characterized by extreme hot weather during the early summer which affected the quality of the nuts at harvest time. One year's study is not sufficient from which to draw any definite conclusions. Several years' records may show that certain varieties grown on certain type soils in Stanislaus County are more profitable and more desirable than others from a commercial standpoint.

Most of the groves in the study are rather young in age as far as walnut growing is concerned, and production will increase as these groves mature. So it is anticipated that the yield will gradually increase each year for the next four or five years until maximum production is reached. The average age of the fourteen groves in this study was 11.7 years.

As to profitableness, the Payne variety showed the greatest profit per acre and the Mayette the least. As to quality, the Payne led, Mayette second, and Franquette third, while the El Monte, Eureka and Concord varieties fell into lower grades. The lower return for Mayettes was due to the lighter production.

The study shows that the average investment per acre in walnuts during 1931 in Stanislaus County was $680.31. The average income per acre was $136.65 and the total costs $85.46, leaving a net profit above all costs of $51.19 per acre. The thirteen mature groves showed a return of 13.5 per cent on the average investment of $680.31 per acre. In many walnut sections of the state growers value walnut groves at twice the above figure; in that event the amount earned would be nearer 6 per cent on the investment per acre.

Table I.

General Summary of 1931 Walnut Study

	High Profit Group	Low Profit Group	Average All Records	Your Record No.
Number of records	7	7	14	
Total acres covered by reports	227.25	188.6	415.85	
Average age of trees in each group	12.3	10.9	11.7	
Average number trees per acre	16.1	20.1	17.9	
Yield--merchantable nuts per acre, lbs.	1029.2	666.8	864.8	
Total yield--pounds per acre	1188.1	787.8	1006.5	
Per cent of nuts merchantable	86.6	84.7	85.9	
Average net price per cwt. all nuts	$ 14.69	$ 11.55	$ 13.58	
Cost of production per cwt.	7.76	9.81	8.49	
Net profit per cwt.	6.93	1.74	5.09	
Cultural labor cost per acre	12.78	9.94	11.49	
Harvesting cost per acre	18.93	11.40	15.52	
Total labor cost per acre	31.71	21.34	27.01	
Material cost per acre	3.06	2.71	2.90	
Cash overhead cost per acre	5.94	5.52	5.75	
Total cash and labor cost per acre	40.71	29.57	35.66	
Depreciation per acre	10.52	7.13	8.99	
Sub-total	51.23	36.70	44.65	
Interest on investment	40.97	40.64	40.81	
Total all costs	92.20	77.34	85.46	
Income per acre	174.52	91.02	136.65	
Income above cash costs per acre	133.81	61.45	100.99	
Capital and management income per acre	123.29	54.32	92.00	
Net profit above all costs per acre	82.32	13.68	51.19	
Investment per acre	682.83	677.29	680.31	
Per cent earned on investment	18.0	9.0	13.5	

The main object of the walnut grower is to make as much profit from an acre of trees as possible. In order to bring out those things responsible for high profit, the 14 bearing walnut groves in this study were divided into two groups. The 7 records showing the highest net profit per acre constitute the high profit group, averages for which appear in the first column in tables I to VI inclusive. The 7 records having the lowest net profit per acre appear in the next column, while the averages of all 14 records appear in the third column. The blank column at the right in each cooperator's copy contains figures for his orchard so that he can make comparisons to the other averages shown.

The above table shows that the high profit group had a greater profit per acre because of a heavier total yield of nuts and a higher price received for all nuts sold. The trees in this high profit group are slightly older and consequently had somewhat higher cultural costs and higher harvesting costs because of heavier yield. The higher price received for nuts sold by this group is largely due to better quality as shown in table II.

Net profit is the amount by which the total income exceeds total costs. The capital and management income is the amount by which the total income exceeds all costs except interest on investment.

Table II.

Grades and Income per Hundred-weight

	High Profit Group	Low Profit Group	Average All Records	Your Record No.
Per cent of nuts Diamond grade	58.5	15.1	43.1	
Per cent Emerald	11.9	15.8	13.3	
Per cent California	16.2	53.8	29.5	
Total per cent merchantable	86.6	84.7	85.9	
Per cent culls	8.4	12.7	9.9	
Per cent blows	5.0	2.6	4.2	
Total per cent	100.0	100.0	100.0	
Average price all Diamonds per cwt.	$18.45	$18.15	$18.42	
Average price all Emeralds	14.53	13.98	14.30	
Average price all Californias	11.30	11.38	11.35	
Average price all merchantable nuts	16.58	13.08	15.35	
Average price culls (estimated)	3.60	3.82	3.70	
Average price blows	- -	- -	- -	
Average price per cwt. all nuts sold	14.69	11.55	13.58	

The above table shows the percentage of total nuts falling into each quality grade. It will be seen that the high profit group had over 58 per cent of Diamond brand nuts while the low profit group had only 15 per cent. This is responsible for the higher price per hundred-weight received for nuts sold by the high profit group.

Table III.

Cost per Hundred-weight of Nuts

Average yield--pounds per acre	1188.1	787.8	1006.5	
Cultural labor cost per cwt.	$ 1.08	$ 1.26	$ 1.14	
Picking, hulling, drying	1.42	1.31	1.38	
Delivering to market	.17	.14	.16	
Total labor cost per cwt.	2.67	2.71	2.68	
Material cost per cwt.	.26	.34	.29	
Cash overhead cost per cwt.	.50	.70	.57	
Total cash and labor cost	3.43	3.75	3.54	
Depreciation	.88	.90	.89	
Total cash labor and depreciation cost	4.31	4.66	4.43	
Interest on investment	3.45	5.16	4.06	
Total all costs	7.76	9.81	8.49	
Income or average price per cwt.	14.69	11.55	13.58	
Income above cash and labor costs	11.26	7.80	10.04	
Capital and management income	4.33	6.06	4.95	
Net profit per cwt.	6.93	1.74	5.09	

The above table shows that it cost the high profit group less per hundred-weight to produce their nuts than it cost the low profit group, in spite of the higher cost per acre. This is because of the heavier yield which means that there are more pounds of nuts to share a given cost per acre and consequently the cost per hundred-weight of nuts is lower.

Table IV.

Labor Costs per Acre

	Total Acres Performing	High Profit Group	Low Profit Group	Average All Records	Your Record No.
Pruning	415.9	$ 2.61	$ 1.54	$ 2.12	
Brush disposal	218.3	.97	.57	.74	
Cover crop planting	15.0	.60	.74	.73	
Applying fertilizers	24.0	2.35	3.25	2.72	
Pest control	75.8	.10	.22	.15	
Disease control	247.8	.89	.68	.83	
Cultivation	415.9	5.52	3.85	4.76	
Irrigation	373.9	2.52	3.12	2.82	
Bracing and grafting	160.0	.98	1.45	1.19	
Heating	90.0	2.32	- -	2.32	
Miscellaneous	45.8	.11	- -	.11	
Average total cultural costs	415.9	12.78	9.94	11.49	
Comparative total					
Harvesting, hulling, drying	415.9	16.84	10.33	13.89	
Delivering to market	415.9	2.09	1.07	1.63	
Average total labor cost	415.9	31.71	21.34	27.01	
Comparative total					

The costs of performing each operation upon the acreage performing that operation are shown in the above table. Since not all orchards performed each operation, the average total cultural costs and also the average total labor costs are less than a sum of the costs for the separate operations. The comparative total is inserted in each cooperator's copy and is the total which covers the same operations which he performed and to which he can compare his total cost.

The above labor costs are composed of the value of the cooperator's own labor plus the cost of hired labor, plus the cost of field power, such as horses, tractors and trucks. The costs of field power are based upon an hourly estimate for each separate cooperator at a level sufficient to cover interest and depreciation, as well as the repair, maintenance, and operation costs. To the extent that the grower himself performed part of the above labor, the above costs are not strictly cash costs but are considered as such throughout this study since a good many of the growers hired all labor performed.

Table V.

Material Cost per Acre

	High Profit Group	Low Profit Group	Average All Records	Your Record No.
Irrigation taxes or water cost	$1.73	$2.50	$2.08	
Cover crop seed	.90	.80	.81	
Pest control	.33	.93	.43	
Disease control	.54	.34	.49	
Bracing	.84	- -	.84	
Heating	.26	- -	.26	
Harvesting	1.02	.11	.77	
Miscellaneous	.23	1.19	.65	
Average total	3.06	2.71	2.90	
Comparative total				

Material costs per acre for each item of expense upon the acreage using that material are shown above. Since not all acreages reported each item of expense the average totals are considerably less than a sum of the item costs. Little opportunity exists for reducing any of the above items as they are already at a very low level.

Table VI.

Cash Overhead Costs per Acre

	High Profit Group	Low Profit Group	Average All Records	Your Record No.
General expense	$1.74	$1.20	$1.50	
County taxes	3.10	4.06	3.53	
Machinery repairs	.91	.14	.71	
Compensation and other insurance	.74	3.81	.63	
Other cash costs	- -	- -	- -	
Average total cash overhead cost	5.94	5.52	5.75	

General expense which is included in the above table, is computed at five per cent of the total labor and material costs and is included in these costs to cover miscellaneous small, unreported costs.

Table VII.

Investment and Investment Overhead per Acre
Average of All 14 Records

	Your Investment	Investment per Acre	Interest per Acre at 6%	Your Interest	Depreciation per Acre	Your Deprec. per Acre
Trees		$402.86	$ 24.17		$ 4.65	
Improvements		21.09	1.26		.79	
Equipment		33.28	2.00		3.55	
Land		223.08	13.38		- -	
Total per acre		680.31	40.81		8.99	
Horses, tractors, trucks		8.69				
Grand total		689.00				

Investment overhead costs are based upon an annual inventory obtained from each cooperator. The investments shown above are intended to represent present values--that is, original costs less previously charged depreciation. They do not represent original costs or market value. Interest is computed at six per cent and is included to cover the cost of capital to the business, either borrowed or owner invested. Depreciation is based upon the cost and expected life of each item in the inventory.

Table VIII which follows, shows in condensed form the tree value and depreciation table used in setting a value for trees of each age. This table is based upon a tree cost of $440.00 by the twelfth year and a total life of trees of 55 years, depreciation being charged to write off the cost of the trees by the end of this period.

Table VIII.

Tree Values and Overhead Charges by Age of Trees

Age Beginning Year	Value Beginning Year	Value Close of Year	Average Value for Year	Interest at 6%	Depreciation	Total Overhead Charge
0	0	$ 70.00	$ 35.00	$ 2.10	- -	$ 2.10
1	$ 70.00	110.00	90.00	5.40	- -	5.40
2	110.00	160.00	135.00	8.10	- -	8.10
3	160.00	210.00	185.00	11.10	- -	11.10
4	210.00	260.00	235.00	14.10	- -	14.10
5	260.00	300.00	280.00	16.80	- -	16.80
6	300.00	340.00	320.00	19.20	- -	19.20
7	340.00	380.00	360.00	21.60	- -	21.60
8	380.00	410.00	395.00	23.70	- -	23.70
9	410.00	430.00	420.00	25.20	- -	25.20
10	430.00	440.00	435.00	26.10	- -	26.10
11	440.00	440.00	440.00	26.40	- -	26.40
12	440.00	430.00	435.00	26.10	$10.00	36.10
13	430.00	420.00	425.00	25.50	10.00	35.50
14	420.00	410.00	415.00	24.90	10.00	34.90
etc.						
25	310.00	300.00	305.00	18.30	10.00	28.30
45	110.00	100.00	105.00	6.30	10.00	16.30
55	10.00	- -	5.00	.30	10.00	10.30

Table IX.

Profit-Determining Factors in Individual Walnut Groves

Serial No.	Age Trees	Principal Variety	Yield Pounds per Acre	% Diamond and Emerald	Ave. Price per Cwt.	Total Income per Acre	Labor Cost per Acre	Material Cost per Acre	Cash Over-Head per Acre	Int. and Depreciation	Total All Costs per Acre	Income Above Cash Costs per A	Net Profit per Acre
6	15	Franq.	1506.9	87.5	$16.37	$246.76	$21.66	$ 3.54	$ 5.95	$53.14	$ 84.29	$215.61	$162.47
2	16	Mayette	1227.4	90.9	16.83	206.56	33.84	4.40	7.01	54.60	99.85	161.31	106.71
8	10.8	Payne	1211.3	87.8	16.03	194.20	38.71	3.37	6.58	28.79	103.84	145.54	90.36
10	14	Eureka	1266.4	43.9	12.37	155.24	32.43	3.32	3.82	49.55	89.12	117.12	67.57
13	16	Mixed	1784.9	20.9	10.96	195.62	54.36	5.83	10.24	63.61	134.04	125.19	61.58
11	21	Mayette	656.6	70.2	14.66	96.28	14.76	.27	5.23	40.12	60.38	76.02	35.90
1B	16	Franq.	978.0	80.4	12.79	125.08	23.57	11.50	6.37	51.67	93.11	83.64	31.97
12	11	Eureka	1073.9	12.2	11.08	118.97	30.05	1.32	6.18	58.12	95.67	81.42	23.30
5	17	Franq.	1210.0	8.0	9.37	113.35	33.69	1.70	4.16	51.82	91.37	73.80	21.98
7	10	Mixed	888.7	42.5	11.63	103.33	27.26	3.93	5.85	45.35	82.39	66.29	20.94
14	7.2	Mixed	472.5	78.2	14.46	68.34	11.45	1.75	5.71	39.24	58.15	49.43	10.19
4	12	Mixed	1129.6	11.5	10.20	115.28	32.68	5.02	5.78	62.88	106.36	71.80	8.92
1A	16	Mayette	609.1	91.8	15.81	96.32	23.78	8.81	6.24	51.67	90.50	57.49	5.82
15	9	Eureka	643.1	.3	10.18	65.45	11.74	4.31	4.96	44.23	65.24	44.44	.21
3*	5.8	Mixed	192.6	14.8	11.05	21.29	11.31	4.17	4.53	39.50	20.01	1.28	-38.22
High	12.3	- -	1188.1	70.4	14.66	174.23	31.71	3.06	5.94	51.49	92.20	133.81	82.32
Low	10.9	- -	787.8	30.9	11.55	91.02	21.34	2.71	5.52	47.77	77.34	61.45	13.68
Ave.	11.7	- -	1006.5	56.4	13.56	136.49	27.01	2.90	5.75	49.80	85.46	100.99	51.19

* Young non-bearing grove not included in averages.

The main factors determining the profit in each grove are shown in the above table. Orchards are listed in the order of their net profit per acre with group averages at the bottom of the table. It will be seen that the high profit group consists largely of records having a high yield per acre as well as a large percentage of Diamond and Emerald brand nuts. This illustrates the often stated truth that the most important factors making for profit in fruit production are yield per acre and price of fruit as determined by quality. The costs per acre are also important but not so important as the other two items.

Record No. 6 has all three of these factors in its favor, having a high yield, a high price due to good quality and low total costs per acre. Record No. 4 in the low profit group has a high yield but rather poor price due to low quality, and rather high costs.

Table X.

Important Cost Items in Individual Groves

Serial No.	Pruning and Brush Disposal per A.	*Cover Crop Cost per A.	*Fertilizer Cost per A.	*Spray or Dust per A.	Cultivation cost per A.	Irrigation Labor per A.	Irrig. Water Cost per A.	Total Cultural Labor per A.	Picking per Cwt.	Hull Dry per Cwt.	Total Harvest per Cwt.	Haul Market per Cwt.	Total Labor Cost per A.
6	$ .91	- -	- -	- -	$3.89	$1.14	$3.54	$5.94	- -	- -	$ .89	$ .15	$21.66
2	2.29	- -	- -	- -	4.92	.35	4.40	7.56	1.64	.25	1.89	.25	33.84
8	4.52	- -	- -	2.72	8.00	4.19	1.17	21.73	.98	.22	1.20	.20	38.71
10	3.72	- -	- -	.80	3.18	.43	.39	7.56	1.40	.41	1.82	.15	32.43
13	3.72	- -	2.35	1.25	5.40	1.68	3.74	13.15	- -	- -	2.16	.15	54.36
11	.30	- -	- -	.24	4.00	- -	- -	4.38	- -	- -	1.40	.18	14.76
1B	1.30	1.50	- -	- -	4.27	6.35	10.60	12.52	- -	- -	1.03	.10	23.57
12	4.10	- -	- -	- -	5.71	6.39	- -	16.20	- -	- -	1.17	.12	30.05
5	.63	- -	- -	1.13	6.07	6.08	.77	13.00	- -	- -	1.56	.15	33.69
7	2.36	- -	3.25	- -	7.82	.66	3.74	14.09	- -	- -	1.31	.17	27.26
14	1.59	- -	- -	1.02	1.04	.30	1.41	5.07	- -	- -	1.20	.15	11.45
4	2.43	- -	- -	- -	7.56	3.32	5.02	13.31	- -	- -	1.58	.13	32.68
1A	1.59	1.64	- -	- -	3.43	6.83	7.91	12.59	- -	- -	1.74	.10	23.78
15	.78	.75	- -	- -	3.46	1.50	3.52	5.74	- -	- -	.81	.13	11.74
N.B. 3	.04	- -	- -	1.05	5.27	1.32	3.75	7.26	- -	- -	1.78	.32	11.31
High	3.58	1.50	2.35	1.86	5.52	2.52	1.73	12.78	- -	- -	1.42	.17	31.71
Low	2.11	1.54	3.25	2.17	3.85	3.12	2.50	9.94	- -	- -	1.31	.14	21.34
Ave.	2.86	1.53	2.72	1.90	4.76	2.82	2.08	11.49	- -	- -	1.38	.16	27.01

* Total labor and materials per acre

N.B. Non-bearing record

Some of the most important costs for items in individual orchards are shown in the above table. In general it might be said of all the costs shown above that little opportunity exists for much further saving because they are all at rather low levels.

Record No. 13 with the highest labor cost per acre, might possibly find some opportunity for a reduction in costs although it is difficult to find any single item which is out of line, unless it be that of harvesting costs per hundred-weight.

Table XI.

General Summary of Different Varieties

	Payne	Franquette	Concord	El Monte	Eureka	Mayette
Number records	2	7	5	2	7	6
Acres reporting	91.2	54.32	15.59	11.7	77.53	71.3
Average age trees	10.9	16.1	15.1	11.5	11.9	18.0
Number trees per acre	15.8	22.6	19.0	27.4	16.0	17.7
Yield--pounds per acre	1274.9	1290.2	1324.8	1497.9	1191.3	620.8
Average price per cwt.	$ 16.03	$ 12.43	$ 12.14	$ 10.11	$ 11.80	$ 15.38
Total cost per cwt.	8.12	7.08	7.08	6.25	7.40	12.10
Net profit per cwt.	7.91	5.35	5.06	3.86	4.40	3.28
Cultural labor cost per acre	20.64	11.15	8.58	9.04	10.02	8.00
Harvest cost per acre	18.68	20.30	20.71	26.20	17.78	11.31
Total labor cost	39.32	31.45	29.29	35.24	27.80	19.31
Material cost per acre	3.37	2.63	3.61	2.98	3.14	2.82
Cash overhead	6.43	4.99	6.40	4.38	5.55	5.75
Total cash and labor cost	49.12	39.07	39.30	42.60	36.49	27.88
Depreciation	6.08	13.64	12.77	14.37	8.50	12.16
Sub-total	55.20	52.71	52.07	56.97	44.99	40.04
Interest on investment	48.37	38.61	41.73	36.65	43.19	35.08
Total all costs	103.57	91.32	93.80	93.62	88.18	75.12
Income per acre	204.41	160.37	160.82	151.46	140.59	95.45
Income above cash costs per a.	155.29	121.30	121.52	108.86	104.10	67.57
Capital and management income per acre	149.21	107.66	108.75	94.49	95.60	55.41
Net profit per acre	100.84	69.05	67.02	57.84	52.41	20.33

A general summary of the six main varieties appearing in this study is presented in the above table. The varieties are listed in the order of their net profit per acre.

It should be borne in mind that some of the varieties above are not covered by enough records to make comparisons conclusive or adequate. This year's report is merely a progress report and final conclusions as to which varieties are the most profitable should be deferred until the close of this study, at which time five years of records will be available.

The Mayette shows the lowest average yield and also the greatest average age. The average price received for this variety was the second highest. Whether or not the higher price will make up for its shy-bearing characteristic is a question that one year's study cannot answer.

Table XII.

Per Cent of Nuts in Each Size and Quality Grade

	Payne	Franquette	Concord	El Monte	Eureka	Mayette
Diamond Large	74.1	27.9	20.6	- -	11.8	59.3
Diamond Fancy	10.2	4.0	.8	- -	.7	3.8
Total per cent Diamond	84.3	31.9	21.4	- -	12.5	63.1
Emerald Large	.4	8.4	17.7	11.2	11.1	12.8
Emerald Fancy	- -	1.6	.1	.5	1.1	1.0
Emerald Babies	3.4	4.9	.4	.7	.6	1.1
Total per cent Emerald	3.8	14.9	18.2	12.4	12.8	14.9
California Large	) .1	28.9	42.9	63.3	55.2	9.6
California Fancy	)	6.6	2.4	1.6	4.0	1.7
California Babies	- -	.1	.7	.3	.2	.8
Total per cent California	.1	35.6	46.0	65.2	59.4	12.1
Total per cent merchantable	88.2	82.4	85.6	77.6	84.7	90.1
Culls	5.9	11.8	8.5	20.7	11.8	8.3
Blows	5.9	5.8	5.9	1.7	3.5	1.6
Total	100.0	100.0	100.0	100.0	100.0	100.0

The above table shows the per cent of nuts delivered from each variety falling in the various size and quality grades.

The following table shows the net prices per hundred-weight for each grade and variety. These net prices are based upon association sale prices less house charges. Three local walnut associations are represented by cooperators in this study.

Table XIII.

Net Prices Received per Cwt. for Each Grade by Varieties

	Payne	Franquette	Concord	El Monte	Eureka	Mayette
Diamond Large	$18.53	$18.82	$19.02	- -	$19.90	$18.36
Diamond Fancy	16.62	16.90	17.12	- -	18.02	16.46
All Diamonds	18.30	18.58	18.95	- -	19.80	18.25
Emerald Large	15.30	15.30	14.88	15.30	16.67	15.30
Emerald Fancy	- -	13.86	13.87	12.45	15.40	13.86
Emerald Babies	10.07	10.09	9.97	9.60	10.05	9.28
All Emeralds	10.62	13.44	14.77	14.85	16.24	14.74
California Large	11.50	11.49	11.12	11.50	11.50	11.50
California Fancy	11.02	11.02	10.90	10.55	11.02	11.02
California Babies	- -	6.25	6.57	6.27	6.27	6.27
All Californias	11.44	11.40	11.04	11.45	11.44	11.10
All merchantable nuts	17.96	14.55	13.81	12.00	13.40	16.71
Culls (estimate)	3.26	3.77	3.70	3.83	3.77	3.82
Blows	- -	- -	- -	- -	- -	- -
Average all nuts	16.03	12.43	12.14	10.11	11.80	15.38