

1954

CS-SI-54-2

Citrus Production  
Cost Study—

Lemons & Grapefruit

SAN BERNARDINO COUNTY  
TEN YEAR SUMMARY  
1945 - 1954  
AGRICULTURAL EXTENSION SERVICE  
UNIVERSITY OF CALIFORNIA

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

These Citrus Management Studies, from various counties in Southern California, have come to be the basic source of information by agencies considering tariff, railroad freight rates, and other such regulations.

Basic information contained within this summary is combined with similar information from other counties by the California Citrus League to draw up their annual summaries of citrus cost of production. These studies are conducted with the cooperation and assistance of Mr. George Ferguson of that organization. The Extension Service is extremely grateful for this assistance.

Without the valuable cooperation of the growers who furnish these records, sound information would not be available for the use of the Interstate Commerce Commission, in consideration of freight rates, and tariff commissions and such organizations.

The only source of this information can be the grower himself. To the grower, in the comparison of his records with other growers, they should furnish comparative information with his neighbors in the county.

The longer these records are maintained, the more valuable they become in the evaluation of various practices. To this extent these records are continuously used in economic studies of the citrus industries in the county.

Summarized and analyzed by

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EXPLANATION OF TERMS

Averages shown in this report include mature orchards of the variety covered except for occasional trees of another variety. Mature orchards are those which are nine years old or over at the start of the record year, or younger orchards having reached full commercial bearing.

Yields, costs, and returns are computed in packed boxes regardless of whether all fruit was so packed. All fruit, including culls, is converted to this basis and included in total yield.

Income is computed for fruit delivered at the packing house where production stops and marketing begins; hence, picking and hauling are shown as production costs and not deducted from gross income as are packing and marketing costs.

Labor cost is composed of the cost of hired labor, the value of the operator's own labor, the value or cost of field power, as horses, tractors, and trucks, and in some cases the total contract cost of the performance of operations.

Cultural labor is for cultural operations, and does not include harvesting.

Harvesting cost is composed of picking and hauling the fruit to the packing house.

Material cost is composed of the expense for fertilizers, water, pest control materials, etc.

Cash overhead cost includes all cash costs other than for labor and materials - as taxes, repairs, insurance, and general expense.

Total cash cost is the sum of all above costs or is the total of all costs except depreciation and interest on investment, with the owner's own labor considered as though it were a direct cash cost.

Depreciation is the share of the original cost of facilities which should be charged to each year of operation.

Interest on investment is computed at 5 per cent of the average value of facilities over their useful life.

Total cost of production includes all the above items and therefore covers wages for all labor performed; and through depreciation and interest, provides for the necessary replacement of facilities and the cost or reimbursement for the use of invested capital.

Management income is total income less total costs of production. It is the amount available to reimburse the operator for his management after all other costs are met. If income is insufficient to meet costs, the loss is shown by a minus sign (-) preceding the amount.

Capital and management income is management income plus the interest on investment. It may be considered as profit, if interest is not considered a cost.

Capital income is capital and management income less an allowance for management estimated at 5 per cent of the total cost per acre. It may be considered as the earning of money or capital invested.

Cultural cost is the total expense for cultural labor and materials used.

TABLE 1 - GENERAL SUMMARY AND COMPARISON OF LEMON RECORD AVERAGE FOR 10 YEARS

	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	10 Year Average
Number of Records	17	18	17	16	14	16	16	17	15	16	16
Total Acres	170	217	186	171	157	174	168	186	185	189	180
Average Acres per Record	10	12	11	11	11	11	11	11	12	12	11
Yield, Packed Boxes per Acre	292	310	315	231	206	243	298	265	281	335	278
Per Cent #1 or Fresh Fruit	-	69	74	82	71	78	71	68	69	56	71
Av. Price per Packed Box	2.87	1.98	2.90	3.50	3.36	3.35	3.05	3.57	3.97	2.82	3.09
Total Cost per Box	1.96	1.85	1.89	2.40	2.79	2.57	2.21	2.58	2.51	2.37	2.28
Management Income per Box	.91	.13	1.01	1.10	.57	.78	.84	.99	1.46	.45	.81
Cultural Costs per Acre	267.64	270.00	268.78	256.30	304.05	310.34	269.97	319.59	325.02	357.51	294.92
Cash Overhead Costs	39.21	42.01	50.72	47.96	55.26	58.90	56.31	65.14	61.99	73.05	55.05
Depreciation	14.22	12.87	13.18	11.94	10.56	12.48	14.41	13.43	14.15	15.14	13.24
Interest on Investment	69.05	67.44	69.68	68.20	67.80	68.35	85.71	87.26	86.77	87.30	75.76
Total on Tree Cost per Acre	390.12	392.32	402.36	384.40	437.67	450.07	426.40	485.42	487.93	533.00	438.97
Harvesting Cost per Acre	183.02	182.08	193.48	171.61	137.71	174.32	231.73	198.36	316.11	260.58	194.90
Total Cost per Acre	573.14	574.40	595.84	556.01	575.38	624.39	658.13	683.78	704.04	793.58	633.87
Total Income per Acre	838.92	614.01	913.63	810.76	693.64	812.36	910.66	944.30	1113.76	943.21	859.53
Management Income per Acre	265.78	39.61	317.79	254.75	118.26	187.97	252.53	260.52	409.72	149.63	225.66
Capital and Management Income per Acre	334.83	107.05	387.47	322.95	186.06	256.32	338.24	347.78	496.49	236.93	301.42

The above table gives a brief summary by years for the past 10 years with a 10 year average.

TABLE 2 - MAIN PROFIT DETERMINING FACTORS IN INDIVIDUAL ORCHARDS - PER ACRE

Serial Number	Average Yield Packed Boxes	Average Income Packed Box	Total Income Per Acre	Cult. Labor & Field Power	Material Costs	Cash Over-head Costs	Cash Cost up to Picking	Capital over-head Costs		Total On Tree Cost	Harvesting Costs	Total All Costs	Capital & Management Income	Management Income
								Depreciation	Int. on Invest.					
5001	690	3.27	2257.01	279.05	330.89	121.56	731.50	32.38	88.66	852.54	478.10	1330.64	1015.03	926.37
035	395	3.18	1253.34	167.58	229.83	83.51	480.92	12.33	72.86	566.11	279.39	845.50	480.70	407.84
036	489	2.84	1390.06	332.07	175.41	87.14	594.62	11.00	67.50	673.12	338.93	1012.05	445.51	378.01
538	402	2.87	1154.25	192.99	215.31	88.89	497.19	2.71	81.88	581.78	293.29	875.07	361.06	279.18
044	362	3.04	1099.95	207.84	178.95	80.40	467.19	1.73	80.79	549.71	281.71	831.42	349.32	268.53
458	304	2.62	795.14	137.24	79.61	59.41	276.26	7.06	70.56	353.88	228.78	582.66	283.04	212.48
5003	382	2.71	1032.58	168.39	128.34	63.74	360.47	24.62	100.39	485.48	368.68	854.16	278.81	178.42
004	322	2.44	785.00	88.97	109.38	36.50	234.85	19.73	96.20	350.78	264.85	615.63	265.57	169.37
5002	245	2.88	706.67	110.23	154.93	44.40	309.56	7.95	90.69	408.20	244.56	652.76	144.60	53.91
037	254	2.90	736.19	114.09	216.01	69.16	399.26	28.96	94.70	522.92	180.89	703.81	127.08	32.38
537	225	2.89	649.19	175.97	106.79	91.68	374.44	2.63	81.80	458.87	171.01	629.88	101.11	19.31
711	225	2.93	658.73	207.29	133.94	49.55	390.78	7.37	68.42	466.57	222.64	689.21	37.94	-30.48
026	146	2.76	401.75	130.48	71.68	37.59	239.75	11.79	76.71	328.25	138.22	466.47	11.99	-64.72
016	341	2.60	886.86	367.25	168.71	98.14	634.10	1.73	80.79	716.62	262.97	979.59	-11.94	-92.73
5004	314	2.96	927.01	241.97	329.35	120.88	692.20	34.03	91.36	817.59	225.82	1043.41	-25.04	-116.40
041	178	2.65	472.26	138.80	134.10	53.06	325.96	8.87	103.27	438.10	162.45	600.55	-25.02	-128.29
Av. All	335	2.82	943.21	181.87	175.64	73.05	430.56	15.14	87.30	533.00	260.58	793.58	236.93	149.63

All records in the 1954 study are given a serial number and are arranged in descending order of management income. They are kept in the same order in subsequent tables.

TABLE 3 - YIELDS, QUANTITY, INCOME AND COSTS PER FIELD BOX AND PER PACKED BOX

Serial Number	Yield Per Acre		Fruit Quality Per Cent Sold		Average Income Per Pkd. Box	Cost Per Field Box			Cost Per Packed Box			Income Per Packed Box	
	Packed Box	Field Box	Fresh	Juice Prod. Culls		On Tree	Harvesting	Total All Cost	On Tree	Harvesting	Total All Cost	Capital Management	Mgmt.
5001	690	958	65.0	35.0	3.27	.89	.50	1.39	1.24	.69	1.93	1.47	1.34
035	395	552	61.4	38.6	3.18	1.02	.51	1.53	1.44	.71	2.15	1.22	1.03
036	489	700	52.6	47.4	2.84	.96	.49	1.45	1.38	.69	2.07	.91	.77
538	402	558	53.0	47.0	2.87	1.04	.53	1.57	1.45	.73	2.18	.90	.69
044	362	507	57.6	42.4	3.04	1.08	.56	1.64	1.52	.78	2.30	.96	.74
458	304	439	45.5	54.5	2.62	.81	.52	1.33	1.17	.75	1.92	.93	.70
5003	382	621	52.9	47.1	2.71	.78	.59	1.37	1.27	.97	2.24	.73	.47
004	322	493	56.7	43.3	2.44	.71	.54	1.25	1.09	.82	1.91	.83	.53
5002	245	400	58.4	41.6	2.88	1.02	.61	1.63	1.66	1.00	2.66	.59	.22
037	254	335	54.6	45.4	2.90	1.56	.54	2.10	2.06	.71	2.77	.50	.13
537	225	317	53.5	46.5	2.89	1.45	.54	1.99	2.04	.76	2.80	.45	.09
711	225	367	63.1	36.9	2.93	1.27	.60	1.87	2.08	.99	3.07	.17	-.14
026	146	235	55.7	44.3	2.76	1.39	.59	1.98	2.26	.95	3.21	.08	-.45
016	341	502	44.8	55.2	2.60	1.43	.52	1.95	2.10	.77	2.87	-.03	-.27
5004	314	437	56.4	43.6	2.96	1.87	.52	2.39	2.61	.72	3.33	-.08	-.37
041	178	281	60.1	39.9	2.65	1.56	.58	2.14	2.46	.91	3.37	-.14	-.72
Av. All	335	489	55.9	44.1	2.82	1.09	.53	1.62	1.59	.78	2.37	.71	.45

Packed box: All loose fruit was converted to packed box equivalent - 79%.

Field boxes were not standardized as to weight.

TABLE 4 - IRRIGATION AND FERTILIZER PRACTICES &amp; COSTS, AND OTHER CULTURAL COSTS PER ACRE

Serial Number	Irrigation Costs		Fertilizer Practices and Costs				Other Cultural Costs					Total All Costs
	Labor	Water	Kind and Amount per Acre	Labor Cost	Material	Lbs. N per A.	All Tillage	Pest & Disease L & M	Frost L & M	Pruning	Misc.	
5001	37.50	66.56	8-8-4, 3800#; CaN, 1100#; Dairy, 720 ft.	7.00	202.98	660	23.00	109.08	14.72	74.00	75.10	609.94
035	25.79	69.21	AmS, 279#; CaN, 322#; NH <sub>3</sub> , 222#; Dairy, 699 ft.	2.14	86.45	464	47.53	74.90	45.43	.94	45.02	397.41
036	25.20	56.72	NH <sub>3</sub> , 144#; CaN, 350#; Dairy, 731 ft.	1.00	68.95	355	39.46	85.95	14.59	148.43	67.18	507.48
538	10.00	79.41	Dairy, 1485 ft.	-	103.84	371	40.55	80.97	-	56.91	36.62	408.30
044	18.90	45.92	Dairy, 1530 ft.	-	105.30	383	35.00	87.27	-	90.78	3.62	386.79
458	9.75	36.66	10-10-5	-	18.67	-	25.69	35.71	23.98	37.27	29.12	216.85
5003	12.60	27.25	AmS, 80#; Dairy, 600 ft.	1.82	38.10	167	11.09	44.34	40.21	39.71	81.61	296.73
004	10.18	31.70	NH <sub>3</sub> , 256#.	-	26.90	208	13.01	22.62	41.92	48.33	3.69	198.35
5002	14.25	27.75	AmS, 1000#; Dairy, 600ft.	1.83	60.00	360	12.97	48.85	16.00	36.30	47.21	265.16
037	27.55	51.40	8-8-4, 2792#.	7.03	96.22	223	33.67	61.41	39.39	2.03	11.40	330.10
537	21.05	59.93	Dairy, 400 ft.	-	26.00	121	33.66	72.11	-	37.32	32.69	282.76
711	25.37	22.88	AmP, 77#; CaN, 154#; Poultry, 353 ft.	-	44.01	311	21.16	42.58	55.94	32.58	96.71	341.23
026	12.67	21.34	AmS, 289#; AmP, 112#	2.80	12.67	79	39.43	38.37	18.20	30.65	26.03	202.16
016	21.00	51.49	Dairy, 1093 ft.	-	98.50	273	100.00	67.25	-	81.00	116.72	535.96
5004	29.17	123.03	NH <sub>3</sub> , 35#; CaN, 722#; 8-8-4, 22, 222#; Dairy, 700 ft.	5.55	142.66	497	33.72	69.62	19.97	43.55	104.05	571.32
041	35.14	53.55	CaN, 1053#; Poul, 217 ft.	16.67	43.57	336	25.45	35.65	24.44	18.77	19.66	272.90
Av. All	20.50	55.76		6.72	72.44	306	31.34	56.61	24.38	47.96	45.25	357.51

Irrigation and fertilization are two of the most important practices in orchard management.

TABLE 5 - GENERAL SUMMARY AND COMPARISON OF GRAPEFRUIT RECORD AVERAGES FOR 10 YEARS

	1945	1946	1947	1948	1949	1950	1951	1952	1953	1954	10 Year Average
Number of Records	12	14	11	7	11	9	11	6	5	6	9
Total Acres	72	82	40	54	97	49	75	50	42	49	61
Average Acres per Record	6.0	5.9	3.6	7.7	8.8	5.4	6.8	8.4	8.4	8.2	6.9
Yield Packed Boxes per Acre	314	319	362	338	309	465	361	396	432	321	362
Per Cent No. 1 Fruit	89	65	69	83	56	74	73	46	48	68	67
Aver. Price per Packed Box	2.65	1.61	1.49	1.26	1.14	1.57	1.06	.98	.86	1.47	1.39
Total Cost per Box	1.24	1.36	1.18	1.10	1.16	.81	1.30	1.11	1.01	1.41	1.15
Management Income per Box	1.41	.25	.31	.16	-.02	.76	-.24	-.13	-.15	.06	.24
Cultural Costs per Acre	227.48	266.44	242.89	205.14	184.59	165.57	249.30	228.27	225.27	243.26	223.82
Cash Overhead Costs	33.11	36.14	37.75	40.45	44.36	54.44	56.31	39.66	48.57	57.37	44.82
Depreciation	4.97	5.95	9.27	3.91	3.57	3.13	3.46	3.66	2.85	3.73	4.45
Interest on Investment	54.26	52.70	58.76	52.25	56.86	51.19	71.25	68.39	64.18	69.34	59.92
Total on-tree cost per A.	319.82	361.23	348.67	301.75	289.38	274.33	380.32	339.98	340.87	373.70	333.01
Harvest. Cost per Acre	69.94	72.75	79.37	71.29	71.14	103.86	90.91	98.77	96.67	79.28	83.40
Total Cost per Acre	389.76	433.98	428.04	373.04	360.52	378.19	471.23	438.75	437.54	452.98	416.41
Total Income per Acre	831.69	513.51	539.97	426.97	352.31	729.41	384.11	388.77	373.43	471.58	501.18
Mgmt. Income per Acre	441.93	79.53	111.93	53.93	-8.21	351.22	-87.12	-49.98	-64.11	18.60	84.77
Capital and Management Income per Acre	496.19	132.23	170.69	106.18	48.65	402.41	-15.87	18.41	.07	87.94	144.69

The above table gives a brief summary by years for the past 10 years with a 10 year average.



TABLE 6 - MAIN PROFIT DETERMINING FACTORS IN INDIVIDUAL ORCHARDS - PER ACRE

Serial Number	Average Yield Packed Boxes	Average Income Packed Box	Total Income Per Acre	Cult., Labor & Field Power	Material Costs	Cash Over-head Costs	Cash Cost up to Picking	Capital Over-head Costs		Total On-Tree Cost	Harvesting Costs	Total All Costs	Capital & Management Income	Management Income
								Depreciation	Int. on Invest.					
456	224	3.07	687.74	75.92	172.48	38.64	287.04	4.81	79.17	371.02	78.78	449.80	317.11	237.94
303	356	1.48	526.40	129.60	138.81	61.98	330.39	2.69	61.82	394.90	82.85	477.75	110.47	48.65
010	399	1.62	647.35	233.70	132.48	107.32	473.50	4.18	70.25	547.93	87.06	634.99	82.61	12.36
5005	241	1.28	308.75	57.88	77.11	37.90	172.89	7.95	88.44	269.28	77.39	346.67	50.52	-37.92
461	201	1.08	217.61	137.23	79.60	59.41	276.24	7.06	70.56	353.86	75.75	429.61	-141.44	-212.00
003	122	1.05	128.85	102.55	68.30	32.24	203.09	2.97	110.01	316.07	31.79	347.86	-109.00	-219.01
Av. All	321	1.47	471.58	118.70	124.56	57.37	300.63	3.73	69.34	373.70	79.28	452.98	87.94	18.60

TABLE 7 - YIELDS, QUANTITY, INCOME, AND COSTS PER FIELD BOX AND PER PACKED BOX

Serial Number	Yield Per Acre		Fruit Quality Per Cent Sold		Average Income Per Pkd. Box	Cost Per Field Box			Cost Per Packed Box			Income Per Packed Box	
	Packed Box	Field Box	Fresh	Juice Prod. Culls		On Tree	Harvesting	Total All Cost	On Tree	Harvesting	Total All Cost	Capital & Mgmt.	Management
456	224	429	67.0	33.0	3.07	.86	.19	1.05	1.66	.35	2.01	1.42	1.06
303	356	490	66.7	33.3	1.48	.80	.17	.97	1.11	.23	1.34	.31	.14
010	399	520	69.8	30.2	1.62	1.05	.17	1.22	1.37	.22	1.59	.21	.03
5005	241	372	76.1	23.9	1.28	.72	.21	.93	1.12	.32	1.44	.21	-.16
461	201	303	65.7	34.3	1.08	1.17	.25	1.42	1.76	.38	2.14	-.70	-1.05
003	122	176	56.9	43.1	1.05	1.80	.18	1.98	2.58	.26	2.84	-.89	-1.79
Av. All	321	451	67.8	32.2	1.47	.83	.18	1.00	1.16	.25	1.41	.27	.06

Packed box: All loose fruit was converted to packed box equivalent - 68#.

Field boxes were not standardized as to weight.

TABLE 8 - IRRIGATION AND FERTILIZER PRACTICES &amp; COSTS, AND OTHER CULTURAL COSTS PER ACRE

Serial Number	Irrigation Costs		Fertilizer Practices and Costs				Other Cultural Costs					Total All Costs
	Labor	Water	Kind and Amount per Acre	Labor Cost	Material	Lbs. N per A.	All Tillage	Pest & Disease L & M	Frost L & M	Pruning	Misc.	
456	10.70	22.08	20-0-0, 1046#	-	35.79	209	11.86	123.98	42.39	-	1.60	248.40
303	23.45	64.96	NH <sub>3</sub> , 395#	-	41.45	320	26.42	55.71	-	16.73	39.69	268.41
010	37.87	44.89	CaN, 495#; AmN, 330#	.37	44.08	190	50.41	93.52	-	91.39	3.65	366.18
5005	12.60	27.12	AmS, 82#; Dairy, 600 ft.	1.83	32.62	168	12.90	31.59	-	-	16.33	134.99
461	9.75	36.65	10-10-5	-	18.67	-	25.69	35.71	23.97	37.27	29.12	216.83
003	10.41	32.40	NH <sub>3</sub> , 262#	-	27.50	212	11.30	23.40	-	-	65.84	170.85
Av.All	20.92	55.17		1.60	38.82	277	23.85	52.24	33.18	20.08	35.20	243.26

Irrigation and fertilization are two of the most important practices in orchard management.