



*An
Analysis
of
Almond
Production
Costs
in
California*

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AN ANALYSIS OF ALMOND PRODUCTION COSTS IN CALIFORNIA

There are nearly 282,000 acres of almond trees in California producing over \$199,000,000 of farm income each year. The bearing acreage has increased nearly 2-1/2 times since 1960. Although 35 of the 57 counties in California have reportable numbers of almond trees, 9 counties account for over 80 percent of the total acreage. Production is concentrated in the Central Valley counties but there is a substantial acreage on the central coast in San Luis Obispo County. Much of the present nonbearing acreage is in the counties with larger yields. Although there is considerable annual variation due to weather and other conditions, yields have shown a definite increase over the years because of better management and the planting of new orchards on better soils.

This report summarizes cost of production studies on California almonds from 1973 to 1975. Farm advisors in 3 of the major producing counties have prepared sample costs of production during this period. These costs are not presented as averages for the counties but are representative of commercial orchards with good management and, therefore, estimated yields are usually above the county average. The studies use a wage rate that includes social security, compensation insurance, and other miscellaneous labor costs. Fuel and repairs are based on standard performance rates of the equipment. Material costs include delivery to the orchard. Investment is based on present replacement costs except that land is valued at market price for agricultural purposes. Depreciation is figured on acceptable lengths of life and interest is normally computed at 7 or 8 percent of the average value.

CALIFORNIA ACREAGE, PRODUCTION, AND FARM PRICE
OF ALMONDS, 1940-73

Year	Acreage		Yield per acre	Production (in shell) tons	California farm price in shell ¢ per lb.
	Nonbearing	Bearing			
	acres		pounds in shell		
1940	22,238	75,051	400	15,000	16.2
1941	22,612	77,186	245	9,500	35.2
1942	22,072	79,323	790	31,500	22.1
1943	21,034	81,981	500	20,500	36.6
1944	20,093	84,961	745	31,700	37.2
1945	18,575	88,398	725	32,000	36.0
1946	18,621	91,920	1,025	47,200	24.2
1947	18,409	93,780	760	35,700	27.9
1948	18,296	94,749	770	36,500	21.1
1949	18,554	95,377	910	43,300	16.5
1950	17,911	90,496	830	37,700	27.3
1951	16,272	90,694	945	42,700	23.6
1952	13,561	91,379	800	36,400	23.2
1953	10,928	92,206	835	38,600	23.8
1954	8,752	92,633	935	43,200	29.9
1955	9,256	89,391	855	38,300	43.1
1956	10,270	88,609	1,320	58,600	40.2
1957	16,293	88,212	860	37,500	25.2
1958	19,163	89,545	440	19,800	35.8
1959	22,807	89,155	1,860	82,800	23.3
1960	23,975	89,118	1,180	53,000	26.4
1961	31,674	89,259	1,480	66,400	28.0
1962	31,380	93,054	1,060	48,000	32.2
1963	29,795	97,838	1,240	60,300	30.0
1964	30,885	101,812	1,480	75,400	32.0
1965	43,190	104,980	1,380	72,900	29.7
1966	53,700	107,280	1,580	85,100	30.5
1967	74,630	117,400	1,300	76,600	29.2
1968	81,460	123,790	1,200	74,500	29.9
1969	82,220	133,490	1,820	122,000	30.3
1970	89,470	147,820	1,680	124,000	32.3
1971	85,077	169,016	1,580	134,000	32.5
1972	65,363	186,700	1,340	126,000	39.3
1973	68,087	213,710	1,240	133,000	75.0

Source: California Crop and Livestock Reporting Service.

ALMOND ACREAGE BY COUNTIES - 1973

County	Bearing	Nonbearing	Total
	-Acres-	-Acres-	-Acres-
Shasta	8	--	8
Alameda	28	--	28
Contra Costa	3,934	44	3,978
Lake	227	--	227
Monterey	13	--	13
Napa	--	--	--
San Benito	2	--	2
San Luis Obispo	7,111	132	7,243
Santa Clara	20	--	20
Sonoma	4	--	4
Butte	23,970	4,887	28,857
Colusa	13,702	621	14,323
Glenn	6,317	1,075	7,392
Sacramento	205	--	205
Solano	3,851	251	4,102
Sutter	6,190	343	6,533
Tehama	3,677	1,738	5,415
Yolo	11,464	572	12,036
Yuba	1,770	286	2,056
Fresno	12,974	4,048	17,022
Kern	17,845	19,992	37,837
Kings	484	3,557	4,041
Madera	9,872	5,571	15,443
Merced	32,947	9,645	45,592
San Joaquin	25,168	4,609	29,777
Stanislaus	27,048	8,806	35,854
Tulare	3,625	1,897	5,522
Amador	3	--	3
Calaveras	75	13	88
Placer	243	--	243
Los Angeles	649	--	649
Riverside	14	--	14
San Diego	--	--	--
Santa Barbara	--	--	--
Ventura	--	--	--
Imperial	1	--	1
State	213,441	68,087	281,528

Source: California Crop and Livestock Reporting Service, 1973 California Fruit and Nut Acreage, Sacramento, June 1974.

SUMMARY OF ALMOND COST STUDIES IN CALIFORNIA, 1972 - 75

County	Year	Yield (in shell) lbs.	Cost per acre						Cost per pound (in shell) cents	Total investment per acre dollars	
			Cultural cash and labor	Harvest	Cash over- head	Manage- ment dollars	Depre- ciation	Interest			Total
No. San Joaquin Valley	1975	2,750	382.85	184.10	100.70	103.15	164.05	257.15	1192.00	43.3	4,628.00
So. San Joaquin Valley	1973	2,750	231.70	100.00	53.80	103.15	93.07	128.60	710.00	25.8	2,759.00
Butte	1972	2,000	240.87	56.08	58.00	31.00	96.05	124.06	606.04	30.3	3,034.41

SAMPLE COSTS TO PRODUCE ALMONDS
Northern San Joaquin Valley - 1975

Yield: 2,750 pounds of in-shell nuts. Labor rates including fringe benefits \$2.80 and \$4.00 per hour. Medium wheel tractor per hour cash costs \$1.85.

Operation	Hours per acre	Cash and labor cost per acre				Total
		Labor	Fuel & repairs	Kind and quantity	Cost	
dollars						
<u>Cultural Costs</u>						
Pruning	10.0	28.00				28.00
Brush disposal - 2 men	1.0	8.00	1.85			9.85
Fertilizer 2x				Materials	84.50	
				Application	4.00	88.50
Spray 3-1/2x				Materials and appli- cation	100.10	100.10
Ridging & knock ridges	1.0	4.00	1.85			5.85
Irrigation	3.0	8.40		3-1/2 ac. ft. @ \$4	14.00	22.40
Weed control	1.0	4.00	1.85			5.85
Bees				2 hives @ \$10	20.00	20.00
Disc 2x & springtooth	1.0	4.00	1.85			5.85
Remove & replant 1 tree/ acre					10.00	10.00
Misc. labor, material	2.0		3.70		16.30	20.00
Repairs, except tractor			10.00			10.00
Frost protection - 3 men	1.0	9.60	1.85	Fuel	45.00	56.45
TOTAL CULTURAL COSTS		66.00	22.95		293.90	382.85
<u>Harvest Costs</u>						
Harvest preparation	1.0	4.00	1.85	Herbicide	9.00	14.85
Knock & pole				Contract	56.25	56.25
Rake & sweep	1.0	4.00	10.00			14.00
Pick up				Contract	30.00	30.00
Haul		4.00	1.85			5.85
Hull				2750 lb. @ \$.02	55.00	55.00
TOTAL HARVEST COSTS		12.00	13.70		158.40	184.10
<u>Cash Overhead</u>						
Misc., office, etc.					25.70	
Taxes					75.00	
TOTAL CASH OVERHEAD					100.70	100.70
TOTAL CASH COST		78.00	36.65		553.00	667.65
Management 5% of 2750 lbs. @ \$.75						103.15
<u>Annual Cost</u>						
<u>Investment</u>	<u>Per Acre</u>	<u>Depreciation</u>	<u>Interest 8%</u>			
Land	\$1,800		\$144.00			
Trees	1,782	\$89.10	71.30			
Irrigation system	175	7.00	7.00			
Buildings	75	3.00	3.00			
Equipment	300	30.00	12.00			
Heaters, wind machine, tanks	256	18.95	10.25			
Tractor	240	16.00	9.60			
Total	\$4,628	\$164.05	\$257.15	421.20		
TOTAL COST PER ACRE				1,192.00		
Cost per pound @ 2,750 yield				43.3¢		

SAMPLE COSTS TO PRODUCE ALMONDS
Southern San Joaquin Valley - 1973

Yield: 2,750 pounds of in-shell nuts per year. Labor rates including fringe benefits \$2.30 and \$2.65 per hour. Medium wheel tractor per hour cash costs \$1.40

Operation	Hours per acre	Cash and labor cost per acre				Total
		Labor	Fuel & repairs	Kind and quantity	Cost	
dollars						
<u>Cultural Costs</u>						
Pruning	8.0	18.40				18.40
Brush disposal - 2 men	1.0	4.95	1.40			6.35
Fertilizer				175 lb. N @ \$.11/lb. applied	19.25	19.25
Spray '3x'				Application & mater.	65.00	65.00
Irrigation	2.0	4.60		4 ac. ft. @ \$12	48.00	52.60
Weed control	3.0	7.95	4.20	Materials	7.95	20.10
Bees				2 hives @ \$6	12.00	12.00
Misc. labor & materials					16.00	16.00
Repairs, Except tractor			8.00			8.00
Supervision		14.00				14.00
TOTAL CULTURAL COSTS		49.90	13.60		168.20	231.70
<u>Harvest Costs</u>						
Knock, pick, haul, hull in-shell nuts				@ 5¢/lb. with a max. rate of \$100/ac.	100.00	
TOTAL HARVEST COSTS					100.00	100.00
<u>Cash Overhead</u>						
Misc., office, etc.					21.50	
Taxes					32.00	
TOTAL CASH OVERHEAD					53.50	53.50
TOTAL CASH COST		49.90	13.60		321.70	385.20
Management 5% of 2750 lbs. @ \$.75						103.15
<u>Annual Cost</u>						
<u>Investment</u>	<u>Per Acre</u>			<u>Depreciation</u>	<u>Interest 7%</u>	
Land	\$1,000				\$70.00	
Trees	1,184			\$59.20	41.45	
Irrigation system	250			16.65	8.75	
Buildings & equipment	120			10.00	4.20	
Tractor	205			7.20	4.20	
Total	2,759			93.05	128.60	221.65
TOTAL COST PER ACRE						710.00
Cost per pound @ 2,750 yield						25.8¢

Source: Brown, Lyndon C., et. al., 1973 Almond Orchard Production Costs in the Southern San Joaquin Valley, University of California Agricultural Extension, AXT-391, Berkeley, September 1973.

SAMPLE COSTS TO PRODUCE ALMONDS
Under Nontillage - Using Orchard Heaters
Butte County - 1972

Yield - 2,000 lb. in-shell, labor \$2.00, \$2.25, \$2.50 and \$3.00 plus 10 percent for Social Security and Compensation Insurance.

Operation	Hours per acre	Cash and labor cost per acre				Total
		Labor	Fuel and repairs	Materials Kind and quantity	Cost	
dollars						
<u>Cultural costs</u>						
Prune	8.0	20.00				20.00
Pile brush	3.0	6.00				6.00
Buck brush	0.3	.90	.47			1.37
Fertilize (contract) 2X				3½ lbs. N/tr. + \$2/ac.	21.25	21.25
Spray 3X	1.0	3.00	4.45	Various	40.00	47.45
Place, clean and remove heaters, burn 3X, 2 hrs. @ \$3, 2 hrs. @ \$2	4.0	10.00	2.80	300 gal. oil (5 call outs)	38.85	51.65
Lighting		5.66				5.66
Check thermometers	0.7	2.10	1.16			3.26
Fill heaters	1.5	3.00	2.10			5.10
Blow leaves	0.6	1.50	.90			2.40
Strip spray 2X	0.6	1.80	1.14	Various weed killers	5.00	7.94
Mow 6X	1.5	4.50	3.62			8.12
Irrigate 4X (sprinklers)	4.0	9.00		Power to pump 24 ac.in.	12.87	21.87
Flame 5X	2.5	7.50	5.15	Propane	10.00	22.65
Clean before harvest	0.3	.50	.10			.60
Bees				2 hives @ \$4	8.00	8.00
Total labor		75.46				
10% Soc. Sec. & Workmen's Compensation		7.55				7.55
TOTAL CULTURAL COSTS		83.01	21.89		135.97	240.87
<u>Harvest costs</u>						
Move windfalls	1.0	2.50	1.50			4.00
Knock	3.0	9.00	5.55			14.55
Pole	4.0	9.00				9.00
Rake	0.5	1.12				1.12
Sweep	1.0	2.50	1.50			4.00
Pick up	1.0	3.00	3.50			6.50
Haul to huller	1.0	2.50	1.50			4.00
Hull	1.5	4.50	5.00			9.50
Total Labor		34.12				
10% Soc. Sec. & Workmen's Compensation		3.41				3.41
TOTAL HARVEST COSTS		37.53	18.55			56.08
<u>Cash overhead</u>						
Misc., office, accounting, etc.					15.00	
Taxes (orchard & equipment)					43.00	
TOTAL CASH OVERHEAD					58.00	58.00
TOTAL CASH COST		120.54	40.44		193.97	354.95
Management - 5% of 2,000 lbs. @ 31¢						31.00
Annual Cost						
<u>Investment</u>	<u>Per Acre</u>	<u>Depreciation</u>	<u>Interest</u>			
Land	\$1,100.00	\$ -	\$ 66.00			
Trees	1,100.00	31.46	33.00			
Irrigation system	200.00	13.33	6.00			
Buildings	60.00	2.01	1.81			
Cultural equipment	223.47	20.00	6.72			
Harvest equipment	190.94	15.90	5.73			
Orchard heaters (20)	160.00	13.33	4.80			
Total	\$3,034.41	\$96.03	\$124.06			220.09
TOTAL COST PER ACRE						606.04
Cost per pound @ 2,000 lb. yield						30.3¢

Source: Meith, Clem, et. al., Almond Production Costs, University of California Agricultural Extension Mimeo, Oroville: April 1972.

Cultural Equipment for a 160-Acre Almond Orchard
Under Nontillage

1 - Diesel wheel tractor, 50 HP	\$ 7,500
1 - Gasoline wheel tractor, used, 30 HP	2,000
1 - 4 WD Jeep or equal	3,300
1 - Truck, 1-1/2 ton, used	1,000
1 - Orchard sprayer	6,500
1 - Weed sprayer and boom, trailer mounted	750
3 - Heater oil service trailers	2,250
1 - 12-foot chopper	2,000
1 - 7-foot flail mower	800
1 - Flamer	1,500
1 - Front-end loader with brush rake attachment	1,800
2 - Sprinkler pipe trailers	400
1 - Chain saw and miscellaneous pruning equipment	600
2 - Heater oil storage tanks and pumps	2,000
1 - Fuel storage tank and pump	500
Thermometers and frost alarm	200
Soil moisture meter and blocks	150
Shop tools	2,000
Orchard heater lighting equipment	<u>500</u>
	35,750

Harvest Equipment

1 - Pick-up machine	\$ 4,400
1 - Knocker	6,500
1 - Sweeper	3,500
3 - Carts	<u>1,200</u>
	\$15,600

Hulling Plant

1 - Receiving pit	\$ 1,200
1 - Pre-cleaner and stoner, used	1,800
1 - Huller, used	2,000
2 - Air separators	2,500
Miscellaneous elevators, conveyors, bins, motors	3,500
Dust collectors and blowers	650
Electric service and wiring	<u>3,300</u>
	\$14,950
1 - Metal building 40 x 60 x 15 side wall on 4" slab, including shop space	\$ 9,600

SAMPLE COSTS TO ESTABLISH AN ALMOND ORCHARD
 Merced, Stanislaus, San Joaquin Counties
 Northern San Joaquin Valley - 1975

Operation	Year			
	1	2	3	4
Yield in shell				775
Income - \$.75 lb.				581.25
<u>Planting costs</u>				
Disc and float	17.55			
Fumigate soil	50.00			
Land preparation: chisel	30.00			
Plant, prune, layout	33.75			
Trees, 75 @ \$1.30	97.50			
TOTAL PLANTING COSTS	228.80			
<u>Cultural costs</u>				
Prune and remove brush		10.00	15.00	18.75
Fertilize	10.00	10.50	7.35	34.00
Spray	7.00	17.00	33.00	47.50
Cultivate	25.80	25.80	25.80	6.45
Irrigate	15.20	19.20	23.20	27.20
Re-plant		4.50		
Ridging	2.50	2.50	2.50	2.50
Mow centers, spray tree rows for weeds				21.70
Pollination service				12.00
Repairs, except tractor	10.00	10.00	10.00	10.00
Misc. cultural	20.00	20.00	20.00	20.00
TOTAL CULTURAL COSTS	90.50	119.50	136.85	200.10
<u>Harvest costs</u>				
Knock, rake, pick up, haul, hull nuts				69.35
TOTAL HARVEST COSTS				69.35
<u>Overhead costs</u>				
Misc. overhead	21.80	9.80	10.85	18.80
Taxes	44.00	44.00	44.00	44.00
Management	36.00	36.00	36.00	36.00
Depreciation	56.00	56.00	56.00	56.00
Interest	175.60	227.60	267.60	311.60
TOTAL OVERHEAD COSTS	333.40	373.40	414.45	466.40
TOTAL COST PER ACRE	652.70	492.90	551.30	666.50
Net cost per acre	652.70	492.90	551.30	85.25
Accumulated cost	652.70	1,145.60	1,696.90	1,782.15
<u>Investment</u>				
Land	1,800.00	1,800.00	1,800.00	1,800.00
Trees		493.00	1,146.00	1,697.00
Irrigation system	175.00	175.00	175.00	175.00
Buildings	75.00	75.00	75.00	75.00
Equipment	540.00	540.00	540.00	540.00
TOTAL INVESTMENT	2,590.00	3,083.00	3,736.00	4,287.00

Total cost of developing an orchard to the end of the 4th year = \$1,782.15.