



Almond Production Costs *in* California

Division of Agricultural Sciences
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UC Cooperative Extension

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ALMOND PRODUCTION COSTS IN CALIFORNIA

There are nearly 343,000 acres of almond trees in California producing over \$267,000,000 of farm income each year. The bearing acreage has increased nearly 3-1/4 times since 1960. Although 35 of the 57 counties in California have reportable numbers of almond trees, 9 counties account for about 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. Farm advisors of the major producing counties prepared original sample costs of production which were updated to represent current costs for 1979. 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 computed at 9 percent of the average value.

CALIFORNIA ACREAGE, PRODUCTION, AND FARM PRICE OF ALMONDS, 1940-78

Year	Acreage		Yield per acre pounds in shell	Production (in shell) tons	California farm price in shell ¢ per lb.
	Nonbearing acres	Bearing			
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
1974	74,295	231,200	1,640	189,000	45.0
1975	82,405	248,760	1,280	160,000	37.0
1976	80,538	256,740	1,820	233,000	40.5
1977	67,140	273,420	1,860	256,034	52.5
1978	-	300,000	1,680	252,000	89.8

Source: California Crop and Livestock Reporting Service.

ALMOND ACREAGE BY COUNTIES - 1977

County	Bearing	Nonbearing Acres	Total
Shasta	8	-	8
Alameda	11	-	11
Contra Costa	3,472	-	3,472
Lake	227	-	227
Monterey	13	-	13
San Benito	2	-	2
San Luis Obispo	6,433	7	6,440
Santa Clara	1	-	1
Sonoma	2	-	2
Butte	28,176	3,998	32,174
Colusa	14,323	445	14,768
Glenn	6,990	3,707	10,697
Sacramento	46	-	46
Solano	3,445	455	3,900
Sutter	5,636	473	6,109
Tehama	5,241	994	6,235
Yolo	12,067	336	12,403
Yuba	1,968	265	2,233
Fresno	17,076	6,636	23,712
Kern	39,527	18,944	58,471
Kings	4,041	2,825	6,866
Madera	12,882	5,465	18,347
Merced	43,646	6,116	49,762
San Joaquin	26,628	5,561	32,189
Stanislaus	35,842	6,609	42,451
Tulare	4,735	4,299	9,034
Amador	3	-	3
Calaveras	95	-	95
Placer	230	-	230
Los Angeles	632	-	632
Riverside	15	5	20
San Diego	3	-	3
State	273,417	67,140	340,557

Source: California Crop and Livestock Reporting Service, 1977 California Fruit and Nut Acreage, Sacramento, June 1978.

SUMMARY OF ALMOND COST STUDIES IN CALIFORNIA, 1979

County	Yield (in shell) lbs.	Cost per acre							Cost per pound (in shell) Cents	Total invest- ment per acre Dollars
		Cultural cash and labor	Harvest	Cash over- head	Manage- ment	Depre- ciation	Interest	Total		
No. San Joaquin Valley	2,750	526.25	243.50	146.25	103.15	265.65	362.70	1648.00	.60	6060.00
So. San Joaquin Valley	2,750	371.55	202.50	94.15	93.50	172.10	331.20	1265.00	.46	5360.00
Butte	2,000	331.05	89.70	110.45	45.00	155.00	282.80	1014.00	.51	4783.00
San Luis Obispo-- dryland	435	83.00	141.70	53.65	18.00	56.50	163.15	516.00	(meats) 1.18	2425.00

SAMPLE COSTS TO PRODUCE ALMONDS
Northern San Joaquin Valley

Yield: 2,750 pounds of in-shell nuts. Labor rates including fringe benefits \$3.85 and \$5.50 per hour. Medium wheel tractor per hour cash costs \$2.40.

Operation	Hours per acre	Cash and labor cost per acre				Total
		Labor	Fuel & repairs	Materials Kind and quantity	Cost	
Dollars						
Cultural Costs						
Pruning	10.0	38.50				38.50
Brush disposal - 2 men	1.0	11.00	2.40			13.40
Fertilizer 2x				Materials Applications	110.00	115.00
Spray 3-1/2x				Materials & application	5.00	130.00
Ridging & knock ridges	1.0	5.50	2.40			7.90
Irrigation	3.0	11.55		3-1/2 ac.ft. @ \$5	17.50	29.05
Weed control	1.0	5.50	2.40			7.90
Bees				2 hives @ \$12	24.00	24.00
Disc 2x & springtooth	1.0	5.50	2.40			7.90
Remove & replant 1 tree/acre					13.00	13.00
Misc. cultural	2.0	9.35	8.45		21.20	39.00
Frost protection - 3 men	1.0	13.20	2.40	Fuel	60.00	75.60
Interest on operating capital					25.00	25.00
TOTAL CULTURAL COSTS		90.05	29.80		405.70	526.25
Harvest Costs						
Harvest preparation	1.0	5.50	2.40	Herbicide Contract	11.70	19.60
Knock & pole - 35¢ tree					75.00	75.00
Rake & sweep	1.0	5.50	13.00			18.50
Pick up				Contract	40.00	40.00
Haul		5.50	2.40			7.90
Hull				2750 lb. @ \$.03	82.50	82.50
TOTAL HARVEST COSTS		16.50	17.80		209.20	243.50
Cash Overhead						
Misc., office, etc.					46.75	
Taxes					100.00	
TOTAL CASH OVERHEAD					146.75	146.75
TOTAL CASH COST		107.25	47.60		761.65	916.50
Management 5% of 2750 lb. @ \$.75						103.15

Investment	Per acre	Annual cost		
		Depreciation	Interest 9%	
Land	\$2,000		\$180.00	
Trees	2,585	\$129.25	116.30	
Irrigation system	225	9.00	10.15	
Buildings	100	4.00	4.50	
Equipment	500	50.00	22.50	
Heaters, wind machine, tanks	335	41.90	15.10	
Tractor	315	31.50	14.15	
Total	\$6,060	\$265.65	\$362.70	628.35
TOTAL COST PER ACRE				1,648.00
Cost per pound @ 2,750 yield				.60

SAMPLE COSTS TO PRODUCE ALMONDS
Southern San Joaquin Valley

Yield: 2,750 pounds of in-shell nuts per year. Labor rates including fringe benefits \$3.90 and \$4.60 per hour. Medium wheel tractor per hour cash costs \$3.30.

Operation	Hours per acre	Cash and labor cost per acre			Cost	Total
		Labor	Fuel & repairs	Materials Kind and quantity		
Dollars						
Cultural Costs						
Pruning	8.0	31.20				31.20
Brush disposal - 2 men	1.0	7.80	3.30			11.10
Fertilizer				175 lb. N @ \$.25/lb. applied	43.75	43.75
Spray 3x				Application & mater- ials	92.00	92.00
Irrigation	2.0	7.80		4 ac. ft. @ \$14	56.00	63.80
Weed control	3.0	13.80	9.90			23.70
Bees				2 hives @ \$12	24.00	24.00
Misc. labor & materials			8.00		16.00	24.00
Repairs, except tractor			20.00			20.00
Supervision		20.00				20.00
Interest on operating capital					18.00	18.00
TOTAL CULTURAL COSTS		80.60	41.20		249.75	371.55
Harvest Costs						
Knock, pick, haul, in- shell nuts				@ 8¢/lb. with a max. rate of \$120/ac.	120.00	
Hulling				@ 3¢/in-shell lb.	82.50	
TOTAL HARVEST COSTS					202.50	202.50
Cash Overhead						
Misc., office, etc.					34.15	
Taxes					60.00	
TOTAL CASH OVERHEAD					94.15	94.15
TOTAL CASH COST		80.60	41.20		546.40	668.20
Management 5% of 2750 lbs. @ \$.68						93.50

Investment	Per acre	Annual cost		
		Depreciation	Interest 9%	
Land	\$2,000			\$180.00
Trees	2,585	\$129.25		116.30
Irrigation system	280	17.50		12.60
Buildings & equipment	160	13.35		7.20
Tractor	335	12.00		15.10
Total	\$5,360	\$172.10		\$331.20
TOTAL COST PER ACRE				1265.00
Cost per pound @ 2,750 yield				.46

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 Solid Set Sprinklers
Butte County

Yield: 2,000 pounds of in-shell nuts. Labor rates including fringe benefits \$3.90 and \$4.60 per hour.

Operation	Hours per acre	Cash and labor cost per acre				Total
		Labor	Fuel & repairs	Materials Kind and quantity	Cost	
Dollars						
Cultural Costs						
Prune	8.0	31.20				31.20
Pile brush	3.0	11.70				11.70
Buck brush	0.3	1.40	1.00			2.40
Fertilize (contract) 2x				3½ lb. N/tr. + \$2/ac.	40.00	40.00
Spray 3x	1.0	4.60	8.90	Various	80.00	93.50
Sprinkle for frost protection 10x	.06	.25				.25
Strip spray 2x	0.6	2.75	2.30	Various weed killers	10.00	15.05
Mow 6x	1.5	6.90	7.25			14.15
Irrigate 4x (sprinklers)	4.0	15.60		Power to pump 24 ac. in.	24.00	39.60
Flame 5x	2.5	11.50	10.30	Propane	20.00	41.80
Clean before harvest	0.3	1.20	.20			1.40
Bees				2 hives @ \$12	24.00	24.00
Interest on operating capital					16.00	16.00
TOTAL CULTURAL COSTS		87.10	29.95		214.00	331.05
Harvest Costs						
Move windfalls	1.0	3.90	3.00			6.90
Knock	3.0	13.80	11.10			24.90
Pole	4.0	15.60				15.60
Rake	0.5	2.30				2.30
Sweep	1.0	3.90	3.00			6.90
Pick up	1.0	4.60	7.00			11.60
Haul to huller	1.0	3.90	3.00			6.90
Hull	1.5	4.60	10.00			14.60
TOTAL HARVEST COSTS		52.60	37.10			89.70
Cash Overhead						
Misc., office, accounting, etc.					25.45	
Taxes (orchard & equipment)					85.00	
TOTAL CASH OVERHEAD					110.45	110.45
TOTAL CASH COST		139.70	67.05		324.24	531.20
Management 5% of 2,000 lbs. @ 45¢						45.00
Investment						
		Per acre	Annual cost			
			Depreciation	Interest 9%		
Land		\$1,500		\$135.00		
Trees		2,000	\$57.15	90.00		
Irrigation system		350	23.23	15.75		
Buildings		125	4.20	5.65		
Cultural equipment		403	36.65	18.15		
Harvest equipment		405	33.75	18.25		
Total		\$4,783	\$155.00	\$282.80		437.80
TOTAL COST PER ACRE						1014.00
Cost per pound @ 2,000 lb. yield						.51

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

SAMPLE COSTS TO PRODUCE DRYLAND ALMONDS
San Luis Obispo County

Yield: 435 pounds of in-shell nuts. Labor rates including fringe benefits \$4.00 and \$5.00 per hour.

Operation	Hours per acre	Cash and labor cost per acre				Total
		Labor	Fuel & repairs	Materials Kind and quantity	Cost	
Dollars						
Cultural Costs						
Prune	5.0	20.00				20.00
Brush removal	2.0	10.00	12.00			22.00
Bees				2 hives @ \$7	14.00	14.00
Cultivate 3x				Custom @ \$5/time	15.00	15.00
Misc. labor, materials & repairs					8.00	8.00
Interest on operating capital					4.00	4.00
TOTAL CULTURAL COSTS		30.00	12.00		41.00	83.00
Harvest Costs						
Picking				35 sacks in-shell @ \$3.50		122.50
Processing				@ 8¢/lb.		19.20
TOTAL HARVEST COSTS						141.70
Cash Overhead						
Misc., office, etc.					13.65	
Taxes					40.00	
TOTAL CASH OVERHEAD					53.65	53.65
TOTAL CASH COST		30.00	12.00		236.35	278.35
Management 5% of 240 lbs. @ \$1.50						18.00
Investment						
	Per acre	Annual cost				
		Depreciation	Interest 9%			
Land	\$1,200		\$108.00			
Trees & fence	1,100	\$44.00	49.50			
Equipment	125	12.50	5.65			
Total	\$2,425	\$56.50	\$163.15			219.65
TOTAL COST PER ACRE						516.00
Cost per pound @ 435 lb. yield						1.18

Source: Foott, John H. and E. A. Yeary, Sample Costs to Produce Dryland Almonds, 1977, San Luis Obispo County, University of California Cooperative Extension.

CULTURAL EQUIPMENT FOR A 160-ACRE ALMOND ORCHARD

1 - Diesel wheel tractor, 50 HP	\$15,000
1 - Gasoline wheel tractor, used, 30 HP	4,000
1 - 4 WD Jeep or equal	7,000
1 - Truck, 1-1/2 ton, used	3,000
1 - Orchard sprayer	15,000
1 - Weed sprayer and boom, trailer mounted	1,700
1 - 12-foot chopper	4,000
1 - 7-foot flail mower	1,500
1 - Flamer	3,000
1 - Front-end loader with brush rake attachment	4,000
1 - Chain saw and miscellaneous pruning equipment	1,500
Thermometers and frost alarm	400
Soil moisture meter and blocks	300
Shop tools	4,000
	\$64,400

HARVEST EQUIPMENT

1 - Pick-up machine	\$12,500
1 - Knocker	12,000
1 - Sweeper	7,000
3 - Carts	2,000
	\$33,500

HULLING PLANT

1 - Receiving pit	\$ 2,500
1 - Pre-cleaner and stoner, used	4,000
1 - Huller, used	4,200
2 - Air separators	5,000
Miscellaneous elevators, conveyors, bins, motors	7,000
Dust collectors and blowers	1,500
Electric service and wiring	7,000
	\$31,200

1 - Metal building 40 x 60 x 15 ft. side wall on 4" slab, including shop space	\$20,000
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Source: Meith, Clem, et. al., Almond Production Costs, University of California Cooperative Extension mimeo, Oroville: April 1972.

ALMOND ORCHARD ESTABLISHMENT COSTS
Southern San Joaquin Valley

Practices are representative of flood irrigation on the Valley floor. Costs are for a 24 x 24 foot planting with 75 trees per acre. Based on labor costs of \$4.60 and \$3.90 per hour total costs to the grower. Medium wheel tractor per hour cash costs \$3.30, depreciation \$2.00 and interest \$1.00.

	Costs per acre			
	1st Year	2nd Year	3rd Year	4th Year
Yield in nut meats: lbs. per acre				650
Pre-Harvest Cash Costs				
Land preparation	\$ 95			
Disc & float: 3 hrs. labor & tractor	24			
Trees: 75 at \$2.10	158			
Lay out field, plant, prune: 75 at 85¢	64			
Replants: 2 @ \$4.00		\$ 8		
Irrigation preparation	6	6	\$ 12	\$ 9
Fertilize: materials & application	18	20	27	41
Water: \$14 ac. ft.	14	28	42	56
Irrigation labor	16	16	23	23
Spray materials	2	5	45	59
Spray application	5	9	26	33
Disc	12	12	12	
Mow centers, spray borders				46
Pollination service				24
Taxes	28	28	28	60
Misc. labor & field power	24	24	24	24
Misc. repairs	20	20	20	20
Supervision	20	20	20	20
Office & business costs	30	13	19	31
Interest on operating capital	24	9	13	20
TOTAL PRE-HARVEST CASH COSTS	560	218	311	466
Harvest Costs				
Knock, sweep, pick up, haul, hull nuts @ \$.16 lb.				105
TOTAL CASH COSTS	560	218	311	571
Depreciation				
	<u>Investment per acre</u>			
Irrigation system	\$280	18	18	18
Bldgs. & equipment	160	13	13	13
Tractor	140	11	11	11
TOTAL DEPRECIATION		42	42	42
Interest on Investment at 9%				
Irrigation system		13	13	13
Buildings and equipment		7	7	7
Tractor		6	6	6
Land	\$2,000	180	180	180
Interest on accumulated costs			72	121
TOTAL INTEREST ON INVESTMENT	\$2,580	206	278	327
TOTAL COST FOR THE YEAR		808	538	680
CREDIT FOR NUT MEATS \$.68 lb.				442
NET COST FOR THE YEAR		808	538	680
ACCUMULATED NET COST		808	1,346	2,026
			2,026	2,585

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