

U.C. COOPERATIVE EXTENSION

SAMPLE COSTS TO ESTABLISH AND PRODUCE

ALMONDS

SPRINKLER IRRIGATED AND MOWED CENTERS

IN THE NORTHERN SAN JOAQUIN VALLEY - 1992

by

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The detailed costs for almond production in the Northern San Joaquin Valley is presented in this study. The hypothetical farm used in this report consists of 100 acres of which 95 acres are in almond production.

Practices described in this study are based on those production procedures considered typical for this crop and area. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to your situation. This study is only intended as a guide and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans. A blank *Your Cost* column is provided to enter your actual costs on **Table 2, Sample Costs To Produce Almonds** and **Table 3, Sample Costs and Returns Per Acre To Produce Almonds**.

This study consists of General Assumptions for Producing Almonds and eight tables.

Table 1.	Costs Per Acre to Establish An Almond Orchard
Table 2.	Costs Per Acre to Produce Almonds
Table 3.	Cost and Returns Per Acre to Produce Almonds
Table 4.	Monthly Cash Costs Per Acre to Produce Almonds
Table 5.	Annual Equipment, Investment and Business Overhead
Table 6.	Hourly Equipment Costs
Table 7.	Ranging Analysis
Table 8.	Cost and Returns / Breakeven Analysis

For an explanation of calculations used for the study refer to the attached General Assumptions or call the Department of Agricultural Economics, Cooperative Extension, University of California, Davis, California, (916) 752-3589 or call the farm advisor in the county of interest.

A companion study entitled, "[Sample Costs To Produce Organic Almonds In The Northern San Joaquin Valley, Sprinkler Irrigation](#)" is available for those interested in organic almond production or a comparison between the two system.

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GENERAL ASSUMPTIONS FOR ESTABLISHING AND PRODUCING ALMONDS
Sprinkler Irrigated And Mowed Centers
Northern San Joaquin Valley - 1992
U.C. Cooperative Extension

The following is a description of some general assumptions pertaining to sample costs of almond establishment and production in the Northern San Joaquin Valley. The costs are based on typical cultural practices used by growers in this region, some of which may not be used during every production year. These costs are represented on an annual, per acre basis. *The use of trade names in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products.*

1. LAND:

Land is valued at \$5,000 per acre. The farm consists of 100 acres of land. There are 95 acres in the actual almond orchard with another 5 acres of roads and farmstead on which almonds are not grown. This increases the cost of land to \$5,263 per producing acre. No other crops are grown. Land is not depreciated

2. TREES:

No specific varieties of almond trees are assumed in this study. Varieties that might be used include, but not limited to; Nonpareil, Butte, Mission, Price, or Carmel. At least 2 varieties will be planted in the orchard for cross pollination purposes. The trees are planted at 24' X 24' spacings, with 75 trees per acre. Orchard life is estimated to be 25 years.

3. IRRIGATION:

Water for irrigation and frost protection is supplied by two wells on the property. In this study a price of \$54.24 per acre foot for pumped water is calculated and based on the system design and current electrical rates. The orchard is irrigated using a solid set, underground sprinkler irrigation system with double pumps on 2 wells 200 to 250 feet deep. The cost of the system includes the cost of the wells, pumps, filters, mains, submains, laterals and sprinklers and is represented in **Table 5** in the Annual Investment Costs section. The sprinkler irrigation system is installed before the orchard is planted. The life of the system is estimated at 25 years.

Thirty acre inches of water is applied for irrigation purposes and an additional 3 acre inches is used for frost protection for a total of 33 acre inches of water applied during the year. 27 acre inches of irrigation water is applied during the growing season and 3 acre inches is for postharvest irrigation. The sprinkler system is also used to provide water for frost protection and is usually applied in the months of February and March. No assumption is made about effective rainfall. The same amount of water is applied during the establishment years of the orchard as during any production year.

4. ESTABLISHMENT PRACTICES:

In this study, the almond orchard is established on former field and row crop ground. Both the digging of the tree holes and fumigant applications are done by custom operators. A 1/2 inch sized tree is planted at 24' by 24' spacings. Pruning and training is started in the second year and labor time increases in the following years. Thirty acre inches of irrigation water is applied in all years. Water for frost protection is only applied from the fourth year on. Contracting bee hives for pollination begins in the fourth year with one hive per acre. This increases to 2 hives per acre in the fifth year and remains at this level through the life of the orchard.

The management of almond pests and diseases occurs at different times during the year. This study often refers to the months that certain pest sprays are applied, but the actual timing of these control sprays is determined by the tree growth stage that the tree is in or life cycle of the pest. Some of the typical flowering stages mentioned are pink bud, popcorn and full bloom. Refer to the UC Integrated Pest Management For Almonds publication for further information. Insect and disease control starts in the first year with a worm spray. Diazinon 50 WP is used during the first 3 years to control various worms and is applied in increasing amounts as the trees mature. In the first year 1 pound of Diazinon per 100 gallons of water per acre is applied using a sprayer and handgun. This increases to 2 pounds per 200 gallons of water per acre in year 2 and ends with 3 pounds per 300 gallons of water per acre in the third year. Diazinon is discontinued in the fourth year and a mix of Guthion and Omite is used to control both worms and mites. During the second year dormant and nutrient sprays are added to the pest management program. Zinc and boron are the 2 elements mixed in the nutrient spray and are applied alone until the fourth year when Ziram is added to inhibit shot hole disease (*Stigmima carpophila*). This mix is sprayed at the popcorn to full bloom stage. Also in the second year a dormant spray is used to suppress peach twig borer (*Anarsia lineatella*). In the fourth year Rovral is applied during pink bud stage to prevent brown rot (*Monolinia laxa*). In these first 2 years the pest and disease sprays are applied by a sprayer with a handgun instead of with an airblast sprayer due to the small size of the trees. Because of the minor tree size less material per acre is required to effectively treat the trees. Starting in the fourth year these materials are sprayed on the trees using an airblast sprayer.

Weeds are controlled in the first 2 years by 4 annual cultivations in the row centers and 1 winter strip spray, which can be applied in either fall, winter or spring. Starting with the third year cultivating the centers is discontinued and mowing is used to control the native cover. A winter strip spray is applied down the tree row and commences in the first year of orchard establishment. A spring spot spray, which cleans up any weeds that were missed by the winter strip spray, is applied beginning in the third year. A preharvest weed control spray is applied starting in the fourth year in order to clean up the orchard floor in preparation for harvesting. The resident vegetation reseeds itself in the orchard and will grow back in the next year.

Nitrogen fertilizer is applied each year in increasing amounts and is split between spring and summer. The annual rates in pounds per acre of actual nitrogen used in this study are shown in the **Table A**.

Year	Lbs of Actual N/Acre
2	1
3	40
4	80
5	100
6	175
7+	200

5. PRODUCTION PRACTICES:

The cultural, pesticide and fertilizer inputs for the production of almonds vary considerably from grower to grower and orchard to orchard. For this study pruning is done from November through January.

Brush is stacked into the center of the rows and bucked (moved) out of the orchard where it is burned or otherwise disposed of. Bucking and disposal are also done during these same winter months. One tree per acre per year was assumed to die and would need to be replaced. This is removed and replanted in the winter or spring.

Winter sanitation practices include removal of mummy nuts from the trees and their destruction. This reduces the overwintering sites for navel orangeworm (*Amyelois transitella*). Operations for winter sanitation includes; knocking the mummies off the tree with a shaker, blowing the nuts into the row centers with a blower or sweeper, raking and shredding the mummies. Winter sanitation practices start in December and continue through January.

Pest and weed control are achieved by a variety of management techniques. Pest management begins with a dormant spray for control of peach twig borer, San Jose scale (*Quadraspidiotus perniciosus*) and mite eggs. The dormant spray is applied during December and January, before or during bud swell. In February a spray application to manage peach twig borer at the pink bud stage is made. A foliar nutrient spray is mixed with a shot hole spray and is applied in February, sometime between popcorn and full bloom stage. Zinc and boron are commonly applied in the foliar nutrient mix and Ziram is added to inhibit shot hole disease. In July, a spray mix to control navel orangeworm and various mites (*Tetranychus sp. and Panonychus ulmi*), is applied.

Pollination is one of the most important cultural practices required for a good nut set. Having strong, healthy hives in the orchard during bloom increases the probability of higher yields. Two hives per acre are contracted for pollination and are set in the orchard by the beekeeper during February. Honey bees (*Apis mellifera*) are highly susceptible to many of the pesticides used in almond orchards. All bee hives should be moved out of the orchard before any spraying occurs to avoid any pesticides.

One winter strip spray to control weeds in the tree rows can be applied starting in December and continuing through February. In this study, it is sprayed in January. Weed control continues with a spot spray of Roundup in March. Resident species are allowed to grow and become the ground cover in the centers, between the tree rows. The resident cover is mowed 7 times during spring and summer. Frost damage can increase due to the cooling effect caused by ground covers on orchard temperature. Injury to the almond buds can be mitigated by keeping the orchard vegetation mowed low during the bloom period. Mowed vegetation also reduces the number of blooms that can attract bees and increase competition for almond pollination. A Preharvest weed control spray is used to prepare the orchard floor for harvest.

Fifty pounds of actual nitrogen is spread in April just before the first irrigation. An additional 150 pounds of actual nitrogen is applied in July, August or September. Fertility levels in your orchard should be monitored before applying any fertilizer.

Refer to **Table 4** for additional information on monthly production costs. The practices and inputs used in this cost study serve only as a sample or a guide. Variations as to cultural practices and inputs can be significant. Application rates of pesticides mentioned in this study for control purposes are the recommended rates outlined in the [UC IPM Pest Management Guidelines](#). Contact your local farm advisor for advice on production practices.

6. HARVEST:

Harvesting starts in the fourth year of the orchard establishment. As the yield increases the cost to harvest also increases, until orchard maturity is reached in the seventh year. In this cost study the grower contracts to have the almond crop custom harvested. Harvest begins with the early maturing varieties in August and may continue into October for pollenizers and other later maturing varieties. All of the harvest operations are done mechanically except for poling and raking which are performed by hand labor. Hand raking, also known as check raking, moves nuts that were missed by the sweeper into the windrows. For growers that own their equipment and do their own harvesting, the equipment for harvest operations should be inventoried in Investment costs on **Table 5**, and operation costs would be calculated and placed in Harvest costs in **Table 1 and 2**. All custom charges would be subtracted from Harvest costs in **Table 1 and 2**.

7. YIELDS & RETURNS:

Almonds begin bearing an economic crop in the fourth year after planting. Typical annual yields are measured in meat pounds and are shown in

Table B. These yields are from the fourth year of orchard establishment to maturity.

Year	Yield (Meat Lbs/Acre)
4	500
5	1,200
6	1,600
7+	2,000

An estimated price of a \$1.00 per meat pound of almonds is used in this study. Returns will vary and the yields and prices used in this cost study are an estimate taking into consideration current situations.

8. LABOR:

Hourly wages for workers are \$8.00 and \$5.00 per hour for skilled and field workers respectively. Adding 34% for SDI, FICA, insurance and other benefits gives the labor rates shown of \$10.72 per hour for skilled labor and \$6.70 per hour for field labor. The labor for operations involving machinery are 10% higher than the machine hours to account for the extra labor involved in equipment set up, moving, maintenance and repair.

9. OVERHEAD:

County taxes are calculated as 1% of the land value plus 1% of the average value of the trees, equipment, buildings and improvements. Insurance is charged at 0.5% of the average value of the equipment over its useful life. Office expenses are estimated at \$30 per acre and include, but are not limited to office supplies, phone, bookkeeping, accounting, legal fees, etc. Assessment fees collected by the Almond Board of California (ABC) are based on net meat pounds of almonds sold. The ABC assessment fee is \$0.0225 per meat pound and is used for credible brand advertising.

10. INTEREST:

Interest on operating capital is based on cash costs and is calculated monthly for eleven months until harvest at the rate of 9.00% per year. Adjustment for inflation has not been included in these interest rates. Interest is also charged on investment at 4.00% per year to account for income foregone that could be received from an alternative investment (opportunity cost) and is based on the average value of the land, orchard, buildings and equipment.

11. EQUIPMENT COSTS:

In allocating the equipment costs per acre, the following calculations were made and shown in **Table 5**: (a) **Original Cost** of equipment is the cost of the new equipment plus sales tax. (b) **Depreciation** is straight line with a 10% salvage value. (c) **Interest** on investment is calculated as the average value per acre of the equipment during its useful life, multiplied by an interest rate of 4.00%. Average value equals new cost plus salvage value divided by 2 on a per acre basis. (d) The total investment costs are calculated as 60% of the depreciation and the interest reflect a mix of new and used equipment. These values are also used in **Table 2**. Hourly equipment costs are shown in **Table 6**.

12. FUEL & REPAIR:

The fuel and repair cost per acre for each operation in **Table 2**, is determined by multiplying the total hourly operating cost for each piece of equipment in **Table 5**, by the number of hours per acre for that operation. Prices for on-farm delivery of diesel and gasoline are \$0.71 and \$0.98 per gallon respectively.

U.C. COOPERATIVE EXTENSION
 Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH AN ALMOND ORCHARD
 NORTHERN SAN JOAQUIN VALLEY - 1992
 Sprinkler Irrigated and Mowed Centers

Skilled labor: \$8.00 per hour
 Field labor: \$5.70 per hour
 Intererest Rate: 9.00%
 Trees Per Acre: 75

YEAR	Costs Per Acre					
	1st	2nd	3rd	4th	5th	6th
YIELD (Pounds/acre - dry in-shell)				500	1200	1600
Planting costs						
Land preparation - backhoe (8 holes per hour)	351					
Fumigate - methyl bromide custom application	492	3	1			
Disk and Float - 2X	17					
Trees: 75 @ \$5.05 (+2 2nd Yr. and 1 3rd Yr.)	285	8	5			
Survey and plant trees	75	2	1			
TOTAL PLANTING COSTS	\$1,220	\$13	\$7			
Cultural costs:						
Prune and train		\$19	\$25	\$37	\$74	\$74
Irrigate 6X	\$165	165	165	152	152	152
Frost protection 3X				17	17	17
Fertilizer and application	\$16	21	31	45	55	63
Pest control - Dormant		\$29	46	46	46	46
Pest control - Pinkbud				32	32	32
Pest control - Shothole/nutrient		\$16	19	39	39	39
Pest control - Worm/mites	\$14	19	23	56	56	56
Cultivate 4X	\$10	10				
Mow centers 7X			\$33	33	33	33
Weed control - Winter strip	\$67	67	67	67	67	67
Weed control - Spring spot			\$13	13	13	13
Weed control - Preharvest				\$10	10	10
Pollination				\$30	60	60
Miscellaneous costs	\$23	23	23	23	23	23
Pickup use	\$56	56	56	56	56	56
TOTAL CULTURAL COSTS	\$351	\$425	\$501	\$656	\$733	\$741
Harvesting Costs:						
Shake				\$90	\$90	\$90
Pole					\$7	9
Sweep				\$7	16	21
Hand rake				\$2	3	5
Pickup and haul				\$26	63	97
Hull and shell				\$25	60	80
TOTAL HARVEST COSTS				\$150	\$239	\$302
Interest on operating capital @ 9%	\$35	\$7	\$10	\$28	\$33	\$34
Overhead Costs:						
Office Expense	\$30	\$30	\$30	\$30	\$30	\$30
Leaf Analysis	\$5	5	5	5	5	5
ABC Assessment				\$11	27	36
Property Taxes	\$69	69	69	69	69	69
Equipment Insurance	\$34	34	34	34	34	34
Investment Repairs	\$11	11	11	11	11	11
TOTAL OVERHEAD COSTS	\$149	\$149	\$149	\$160	\$176	\$185
NET CASH COSTS FOR THE YEAR	\$1,755	\$594	\$667	\$994	\$1,181	\$1,262
PROFIT FROM INCOME				\$500	\$1,200	\$1,600
TOTAL ACCUMULATED NET CASH COSTS	\$1,755	\$2,349	\$3,016	\$3,510	\$3,491	\$3,153

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Table 1. continued

YEAR	Costs Per Acre					
	1st	2nd	3rd	4th	5th	6th
Depreciation:						
Buildings	\$14	\$14	\$14	\$14	\$14	\$14
Fuel Tanks & Pumps	\$4	4	4	4	4	4
Frost Alarm	\$1	1	1	1	1	1
Shop Tools	\$7	7	7	7	7	7
Sprinkler Irrigation System	\$82	82	82	82	82	82
Equipment	\$38	38	38	38	38	38
TOTAL DEPRECIATION	\$146	\$146	\$146	\$146	\$146	\$146
Interest on Investment @ 4% :						
Buildings	\$9	\$9	\$9	\$9	\$9	\$9
Fuel Tanks & Pumps	\$2	2	2	2	2	2
Frost Alarm	\$1	1	1	1	1	1
Shop Tools	\$3	3	3	3	3	3
Land @ \$5263/acre	\$211	211	211	211	211	211
Sprinkler Irrigation System	\$40	40	40	40	40	40
Equipment	\$11	11	11	11	11	11
TOTAL INTEREST ON INVESTMENT	\$277	\$277	\$277	\$277	\$277	\$277
TOTAL COST FOR THE YEAR	\$2,178	\$1,017	\$1,090	\$1,417	\$1,604	\$1,685
INCOME FROM PRODUCTION				\$500	\$1,200	\$1,600
NET COST FOR THE YEAR	\$2,178	\$1,017	\$1,090	\$917	\$404	\$85
TOTAL ACCUMULATED NET COST	\$2,178	\$3,195	\$4,285	\$5,202	\$5,606	\$5,691

Table 2.

U. C. COOPERATIVE EXTENSION
COSTS PER ACRE TO PRODUCE ALMONDS
NORTHERN SAN JOAQUIN VALLEY - 1992

Labor Rate: \$10.72/hr. machine labor
\$6.70/hr. non-machine labor

Interest Rate: 9.00%
Yield per Acre: 2000.00 lb

Operation	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Cash and Labor Material Cost	Costs per Acre Custom/Rent	Total Cost	Your Cost
Cultural:							
Prune	11.00	73.70	0.00	0.00	0.00	73.70	
Stack Brush	2.01	13.47	0.00	0.00	0.00	13.47	
Buck Brush	0.30	3.86	1.58	0.00	0.00	5.44	
Knock Mummies	0.00	0.00	0.00	0.00	60.00	60.00	
Blow and Rake	0.00	0.00	0.00	0.00	17.50	17.50	
Shred	0.30	3.86	1.73	0.00	0.00	5.59	
Pest Control - Dormant	0.27	3.43	3.32	36.23	0.00	42.98	
Remove Tree	1.00	6.70	0.00	0.00	14.25	20.95	
Plant Tree, Carton & Tank	0.30	2.01	0.00	4.05	0.00	6.06	
Burn Prunings	0.25	1.67	0.00	0.00	0.00	1.67	
Weed Control - Winter Strip	0.30	3.86	1.27	61.17	0.00	66.30	
Pest Control - Pink Bud	0.40	5.15	4.98	23.35	0.00	33.47	
Pollination	0.00	0.00	0.00	0.00	60.00	60.00	
Frost Protection	0.50	3.35	0.00	13.56	0.00	16.91	
Weed Control - Spot Spray	0.30	3.86	1.27	10.13	0.00	15.26	
Pest Control - Shot Hole/Nutrient	0.40	5.15	4.98	30.25	0.00	40.38	
Fertilizer and Application	0.40	5.15	1.01	50.00	10.00	66.15	
Miscellaneous - Attn Replants	0.25	1.67	0.00	2.25	0.00	3.92	
Irrigate	2.22	14.87	0.00	122.04	0.00	136.91	
Mw Centers	1.75	22.51	10.08	0.00	0.00	32.59	
Rodent Control	0.10	1.29	0.22	1.00	0.00	2.50	
Leaf Analysis	0.10	0.67	0.00	0.00	0.50	1.17	
Ant Control	0.20	2.57	1.22	6.48	0.00	10.27	
Pest Control - Worm/Mite	0.40	5.15	4.98	46.95	0.00	57.07	
Miscellaneous - Other	2.00	13.40	0.00	10.00	0.00	23.40	
Miscellaneous - Broken Limbs	0.10	1.29	0.53	0.00	0.00	1.81	
Pickup Truck Use	3.00	38.59	17.44	0.00	0.00	56.03	
Weed Control - Preharvest	0.20	2.57	0.43	10.14	0.00	13.14	
Irrigate - Postharvest	0.28	1.88	0.00	13.56	0.00	15.44	
TOTAL CULTURAL COSTS	28.33	241.67	55.02	441.17	162.25	900.11	
Harvest:							
Shake	0.00	0.00	0.00	0.00	90.00	90.00	
Pol e	1.75	11.72	0.00	0.00	0.00	11.72	
Sweep	0.00	0.00	0.00	0.00	26.25	26.25	
Hand Rake	0.30	2.01	0.00	0.00	0.00	2.01	
Pickup and Haul	0.00	0.00	0.00	0.00	105.00	105.00	
Hull and Shell	0.00	0.00	0.00	0.00	100.00	100.00	
TOTAL HARVEST COSTS	2.05	13.73	0.00	0.00	321.25	334.98	
Interest on operating capital @ 9.00%						46.52	
TOTAL OPERATING COSTS/ ACRE		255.40	55.02	441.17	483.50	1281.62	
TOTAL OPERATING COSTS/ LB						0.64	
CASH OVERHEAD:							
Office Expense						30.00	
ABC Assessment Fee						45.00	
Property Taxes						87.02	
Property Insurance						43.51	
Investment Repairs						11.84	
TOTAL CASH OVERHEAD COSTS						217.37	
TOTAL CASH COSTS/ ACRE						1498.99	
TOTAL CASH COSTS/ LB						0.75	
NON-CASH OVERHEAD:							
Investment	Per producing Acre	Depreciation	Annual Cost	Interest @ 4.00%			
Bui l di ngs	389.47	14.02		8.57		22.59	
Land - Almonds	5263.00			210.52		210.52	
Fuel Tanks & Pumps	85.26	3.84		1.88		5.71	
Shop Tools	115.79	6.95		2.55		9.49	
Or char d Est abli shment	3510.00	167.14		70.20		237.34	
Pr uni ng Equi pment	12.63	1.14		0.28		1.41	
Spr i nkler Irr i gat i on Syst em	1823.68	82.07		40.12		122.19	
Frost Al arm	5.26	0.19		0.12		0.31	
Equi pment	629.24	53.14		13.84		66.98	
TOTAL NON-CASH OVERHEAD COSTS	11834.35	328.48		348.07		676.55	
TOTAL COSTS/ ACRE						2175.53	
TOTAL COSTS/ LB						1.09	

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Table 3.

U. C. COOPERATIVE EXTENSION
COSTS AND RETURNS PER ACRE TO PRODUCE ALMONDS
NORTHERN SAN JOAQUIN VALLEY - 1992

Labor Rate: \$10.72/hr. machine labor		Interest Rate: 9.00%			
\$6.70/hr. non-machine labor					
	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Almonds	2000.00	lb	1.00	2000.00	
TOTAL GROSS RETURNS FOR ALMOND				<u>2000.00</u>	
OPERATING COSTS					
Custom					
Shake Nuts	2.50	hr	60.00	150.00	
Sweep Nuts	1.25	hr	35.00	43.75	
Backhoe Dead Tree	1.00	acre	14.25	14.25	
Pickup Nuts	1.00	hr	65.00	65.00	
Haul Nuts	2000.00	lb	0.02	40.00	
Hull and Shell	2000.00	lb	0.05	100.00	
Miticide:					
Tree Oil	5.00	gal	2.75	13.75	
Kocide	8.00	lb	2.00	16.00	
Omite	5.00	lb	5.65	28.25	
Insecticide:					
Lorsban	2.00	pi nt	6.48	12.96	
Rovral	1.00	lb	23.35	23.35	
Ziram	8.00	lb	2.65	21.20	
Guthion	2.00	lb	9.35	18.70	
Tree:					
Tree - Almond	1.00	each	3.80	3.80	
Miscellaneous:					
Tree Carton	1.00	each	0.05	0.05	
Miscellaneous Cost	2.00	acre	2.25	12.25	
Fertilizer:					
Tank Mix	1.00	tree	0.20	0.20	
Zinc	5.00	lb	1.10	5.50	
Boron	4.50	lb	0.79	3.56	
UN-32	200.00	lb	0.25	50.00	
Herbicide:					
Roundup	5.00	pi nt	5.07	30.41	
Surflan	3.00	pi nt	9.92	29.76	
Goal	1.00	qt	21.27	21.27	
Contract:					
Pollination Fee	2.00	hi ve	30.00	60.00	
Leaf Analysis	1.00	acre	0.50	0.50	
Irrigation:					
Water - Pumped	33.00	aci n	4.52	149.16	
Rent:					
Sprayer Rental	2.00	acre	5.00	10.00	
Rodenticide:					
Strychnine Bait	1.00	each	1.00	1.00	
Labor (machine)	10.10	hrs	10.72	108.27	
Labor (non-machine)	21.96	hrs	6.70	147.13	
Fuel - Gas	7.83	gal	0.98	7.67	
Fuel - Diesel	14.96	gal	0.71	10.62	
Lube				2.75	
Machinery repair				33.96	
Interest on operating capital @ 9.00%				46.52	
TOTAL OPERATING COSTS/ ACRE				<u>1281.62</u>	
TOTAL OPERATING COSTS/ LB				<u>0.64</u>	
NET RETURNS ABOVE OPERATING COSTS				<u>718.38</u>	
CASH OVERHEAD COSTS:					
Office Expense				30.00	
ABC Assessment Fee				45.00	
Property Taxes				87.02	
Property Insurance				43.51	
Investment Repairs				11.84	
TOTAL CASH OVERHEAD COSTS/ ACRE				<u>217.37</u>	
TOTAL CASH COSTS/ ACRE				<u>1498.99</u>	
TOTAL CASH COSTS/ LB				<u>0.75</u>	

Table 4.

U. C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE TO PRODUCE ALMONDS
NORTHERN SAN JOAQUIN VALLEY - 1992

Beginning Ending	NOV 91 OCT 92	NOV 91	DEC 91	JAN 92	FEB 92	MAR 92	APR 92	MAY 92	JUN 92	JUL 92	AUG 92	SEP 92	OCT 92	TOTAL
Cultural:														
Prune		73.70												73.70
Stack Brush		4.49	4.49	4.49										13.47
Buck Brush		1.81	1.81	1.81										5.44
Knock Mummies			30.00	30.00										60.00
Blow and Rake			8.75	8.75										17.50
Shred			2.79	2.79										5.59
Pest Control - Dormant			21.49	21.49										42.98
Remove Tree				20.95										20.95
Plant Tree, Carton & Tank				6.06										6.06
Burn Prunings				1.67										1.67
Weed Control - Winter Strip				66.30										66.30
Pest Control - Pink Bud					33.47									33.47
Pollination					60.00									60.00
Frost Protection					8.46	8.46								16.91
Weed Control - Spot Spray						15.26								15.26
Pest Control - Shot Hole/Nutrient					40.38									40.38
Fertilizer and Application							17.50					48.65		66.15
Miscellaneous - Attn Replant							3.92							3.92
Irrigate							29.13	15.57	30.74	30.74	30.74			136.91
Mow Centers							4.66	4.66	4.66	9.31	9.31			32.59
Rodent Control								1.25		1.25				2.50
Leaf Analysis									1.17					1.17
Ant Control									5.14	5.14				10.27
Pest Control - Worm Mite										57.07				57.07
Miscellaneous - Other	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	1.95	23.40
Miscellaneous - Broken Limbs											1.81			1.81
Pickup Truck Use	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	4.67	56.03
Weed Control - Preharvest											13.14			13.14
Irrigate - Postharvest													15.44	15.44
TOTAL CULTURAL COSTS		86.62	75.95	170.94	148.93	30.33	61.83	28.10	48.32	110.13	61.63	55.27	22.06	900.11
Harvest:														
Shake												90.00		90.00
Pol e												11.72		11.72
Sweep												26.25		26.25
Hand Rake												2.01		2.01
Pickup and Haul												105.00		105.00
Hull and Shell												100.00		100.00
TOTAL HARVEST COSTS												334.98		334.98
Interest on oper. capital		0.65	1.22	2.50	3.62	3.85	4.31	4.52	4.88	5.71	6.17	9.10		46.52
TOTAL OPERATING COSTS/ ACRE		87.27	77.17	173.44	152.55	34.18	66.14	32.62	53.20	115.84	67.80	399.35	22.06	1281.62
TOTAL OPERATING COSTS/ LB		0.04	0.04	0.09	0.08	0.02	0.03	0.02	0.03	0.06	0.03	0.20	0.01	0.64
OVERHEAD:														
Office Expense		2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	2.50	30.00
ABC Assessment Fee												45.00		45.00
Property Taxes				43.51						43.51				87.02
Property Insurance				21.75						21.75				43.51
Investment Repairs	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	0.99	11.84
TOTAL CASH OVERHEAD COSTS		3.49	3.49	68.75	3.49	3.49	3.49	3.49	3.49	68.75	3.49	48.49	3.49	217.37
TOTAL CASH COSTS/ ACRE		90.76	80.66	242.19	156.03	37.67	69.63	36.10	56.69	184.59	71.29	447.84	25.54	1498.99
TOTAL CASH COSTS/ LB		0.05	0.04	0.12	0.08	0.02	0.03	0.02	0.03	0.09	0.04	0.22	0.01	0.75

Table 5

U. C. COOPERATIVE EXTENSION
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
NORTHERN SAN JOAQUIN VALLEY - 1992

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	- Non-Cash Over- Depre- ciation	Inter- est	- Cash Over- Insur- ance	Taxes	Total
92	30HP 2WD Tractor	18100	15	1086.00	398.20	49.78	99.55	1633.53
92	60HP 2WD Tractor	26400	15	1584.00	580.80	72.60	145.20	2382.60
92	ATV 4WD & Sprayer	6955	10	625.90	153.02	19.13	38.25	836.30
92	Brush Rake & Loader	6000	25	216.00	132.00	16.50	33.00	397.50
92	Flail Mower - 10'	5000	10	450.00	110.00	13.75	27.50	601.25
92	Orchard Sprayer 500 Gal	16050	8	1805.63	353.10	44.14	88.28	2291.15
92	Pickup Truck 1/2 Ton	16500	7	2121.43	363.00	45.37	90.75	2620.55
92	Pruning Equipment	1200	5	216.00	26.40	3.30	6.60	252.30
92	Weed Sprayer 100 Gal	3424	10	308.20	75.32	9.41	18.83	411.76
TOTAL		99629		8413.16	2191.84	273.98	547.96	11426.94
60% of New Cost *		59777		5047.90	1315.10	164.39	328.78	6856.16

* Used to reflect a mix of new and used equipment.

ANNUAL INVESTMENT COSTS

Yr	Description	Price	Yrs Life	- Non-Cash Over- Depre- ciation	Inter- est	- Cash Over- Insur- ance	Taxes	Repairs	Total
INVESTMENT									
	Buildings	37000	25	1332.00	814.00	101.75	203.50	100.00	2551.25
	Orchard Establishment	333450	21	15878.50	6669.00	833.63	1667.25	0.00	25048.38
	Frost Alarm	500	25	18.00	11.00	1.38	2.75	25.00	58.13
	Fuel Tanks & Pumps	8100	20	364.50	178.20	22.28	44.55	125.00	734.53
	Land - Almonds	499985			19999.40	2499.93	4999.85	0.00	27499.18
	Pruning Equipment	1200	10	108.00	26.40	3.30	6.60	25.00	169.30
	Shop Tools	11000	15	660.00	242.00	30.25	60.50	100.00	1092.75
	Sprinkler Irrigation Sys.	173250	20	7796.25	3811.50	476.44	952.87	750.00	13787.06
TOTAL INVESTMENT		1064485		26157.25	31751.50	3968.96	7937.87	1125.00	70940.58

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
ABC Assessment Fee	1900.00	cwt	2.25	4275.00
Office Expense	95.00	acre	30.00	2850.00

Table 6.

U. C. COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
NORTHERN SAN JOAQUIN VALLEY - 1992

Yr	Description	Actual Hours Used	COSTS PER HOUR							Total Costs/ Hr.
			- Non-Cash Over- Depre- ciation	Inter- est	- Cash Over- Insur- ance	Taxes	Repairs	Operating Fuel & Lube	Total Oper.	
92	30HP 2WD Tractor	104.5	6.24	2.29	0.29	0.57	1.09	1.20	2.29	11.67
92	60HP 2WD Tractor	430.2	2.21	0.81	0.10	0.20	1.58	2.41	3.99	7.32
92	ATV 4WD & Sprayer	31.4	11.98	2.93	0.37	0.73	0.83	1.13	1.96	17.97
92	Brush Rake & Loader	38.0	3.41	2.08	0.26	0.52	0.87	0.00	0.87	7.15
92	Flail Mower - 10'	194.8	1.39	0.34	0.04	0.08	1.37	0.00	1.37	3.22
92	Orchard Sprayer 500 Gal	139.3	7.78	1.52	0.19	0.38	8.05	0.00	8.05	17.92
92	Pickup Truck 1/2 Ton	285.0	4.47	0.76	0.10	0.19	2.99	2.82	5.81	11.33
92	Pruning Equipment	9.5	13.64	1.67	0.21	0.42	0.00	0.00	0.00	15.93
92	Weed Sprayer 100 Gal	76.0	2.43	0.59	0.07	0.15	1.72	0.00	1.72	4.97

Table 7.

U. C. COOPERATIVE EXTENSION
RANGING ANALYSIS
NORTHERN SAN JOAQUIN VALLEY - 1992

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE ALMOND

	YIELD (LB/ ACRE)						
	1400	1600	1800	2000	2200	2400	2600
OPERATING COSTS/ ACRE:							
Cultural Cost	900	900	900	900	900	900	900
Harvest Cost	331	332	334	335	336	338	339
Interest on operating capital	46	47	47	47	47	47	47
TOTAL OPERATING COSTS/ ACRE	1277	1279	1280	1282	1283	1284	1286
TOTAL OPERATING COSTS/ LB	0.91	0.80	0.71	0.64	0.58	0.54	0.49
CASH OVERHEAD COSTS/ ACRE	217	217	217	217	217	217	217
TOTAL CASH COSTS/ ACRE	1495	1496	1498	1499	1500	1502	1503
TOTAL CASH COSTS/ LB	1.07	0.94	0.83	0.75	0.68	0.63	0.58
NON-CASH OVERHEAD COSTS/ ACRE	677	677	677	677	677	677	677
TOTAL COSTS/ ACRE	2171	2173	2174	2176	2177	2178	2180
TOTAL COSTS/ LB	1.55	1.36	1.21	1.09	0.99	0.91	0.84

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR ALMOND

PRICE (DOLLARS PER LB)	YIELD (LB/ ACRE)						
	1400	1600	1800	2000	2200	2400	2600
0.70	-297	-159	-20	118	257	396	534
0.80	-157	1	160	318	477	636	794
0.90	-17	161	340	518	697	876	1054
1.00	123	321	520	718	917	1116	1314
1.10	263	481	700	918	1137	1356	1574
1.20	403	641	880	1118	1357	1596	1834
1.30	543	801	1060	1318	1577	1836	2094

NET RETURNS PER ACRE ABOVE CASH COSTS FOR ALMOND

PRICE (DOLLARS PER LB)	YIELD (LB/ ACRE)						
	1400	1600	1800	2000	2200	2400	2600
0.70	-515	-376	-238	-99	40	178	317
0.80	-375	-216	-58	101	260	418	577
0.90	-235	-56	122	301	480	658	837
1.00	-95	104	302	501	700	898	1097
1.10	45	264	482	701	920	1138	1357
1.20	185	424	662	901	1140	1378	1617
1.30	325	584	842	1101	1360	1618	1877

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR ALMOND

PRICE (DOLLARS PER LB)	YIELD (LB/ ACRE)						
	1400	1600	1800	2000	2200	2400	2600
0.70	-1191	-1053	-914	-776	-637	-498	-360
0.80	-1051	-893	-734	-576	-417	-258	-100
0.90	-911	-733	-554	-376	-197	-18	160
1.00	-771	-573	-374	-176	23	222	420
1.10	-631	-413	-194	24	243	462	680
1.20	-491	-253	-14	224	463	702	940
1.30	-351	-93	166	424	683	942	1200

Table 8.

U. C. COOPERATIVE EXTENSION
COSTS AND RETURNS / BREAKEVEN ANALYSIS
NORTHERN SAN JOAQUIN VALLEY - 1992

COSTS AND RETURNS - PER ACRE BASIS

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Almond	2000	1282	718	1499	501	2176	- 176

COSTS AND RETURNS - TOTAL ACREAGE

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Almond	190000	121754	68246	142404	47596	206675	- 16675

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	Operating Costs	Breakeven Price To Cover Cash Costs	Total Costs
Almond	2000.0	lb	0.64	\$ per Yield Unit 0.75	1.09

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price (\$/Unit)	Operating Costs	Breakeven Yield To Cover Cash Costs	Total Costs
Almond	lb	1.00	1281.6	Yield Units / Acre 1499.0	2175.5