U.C. COOPERATIVE EXTENSION

SAMPLE COSTS TO ESTABLISH AND PRODUCE

ALMONDS

FLOOD IRRIGATED AND MOWED CENTERS IN THE NORTHERN SAN JOAQUIN VALLEY - 1992

by

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The detailed cost 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.

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, Flood Irrigation" is available for those interested in organic almond production or a comparison between the two system.

GENERAL ASSUMPTIONS FOR ESTABLISHING AND PRODUCING ALMONDS
Flood 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 planted include, but are not limited to; Nonpareil, Butte, Price, Mission 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. The life of the orchard is estimated to be 25 years.

3. IRRIGATION:

Water for irrigation is supplied by a water district. Price per acre or acre foot for district water varies from district to district in this region. In this study a water cost of $19 per acre is used. A total of 40 acre inches of water is applied during the growing season and in 1 postharvest irrigation. Water is delivered to the orchard from the district ditch through an underground pipe and alfalfa valve system. The life of the system is estimated at 25 years. This irrigation system is installed before the orchard is planted.

The orchard is irrigated using a flood irrigation system with permanent berms (raised rows) used for borders on which the trees are planted. No ridging up or knocking down of borders is done during the rest of the life of the orchard. The same rate of water is applied in the establishment years of the orchard as during the production year. Irrigating the orchard during the first few establishment years can be accomplished by running water down furrows on each side of the tree rows. This type of application could reduce the amount of water applied during these early years, but is not assumed in this study. No assumption is made about effective rainfall.

4. ESTABLISHMENT PRACTICES:

In this study, the almond orchard is established on ground that was previously planted to various field and row crops. Both the digging of the tree holes and fumigation are done by custom operators. A 1/2 inch sized tree is planted at 24' by 24' spacings, on a berm that extends the length of the tree row. These ridged tree rows also serve as the permanent borders for the irrigation system. Pruning and training is started in the second year and labor time increases in the following years. 40 acre inches of irrigation water is applied in all years. 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 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 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 (*Stigmina 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**.

Table A. Annual Fertilizer Applications

Year	Lbs of Actual N/Acre
1	20
2	40
3	80
4	100
5	140
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 row can be applied during December and continuing through February. Weed control continues with a spot spray of Roundup in spring. 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.

Table B. Establishment Almond Yields

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. Adjustments 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 6**, 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
SAMPLE COSTS PER ACRE TO ESTABLISH AN ALMOND ORCHARD
NORTHERN SAN JOAQUIN VALLEY - 1992
Flood Irrigated and Mowed Centers

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

Interest rate: 9.00%
Trees/Acre: 75

	Costs Per Acre					
YEAR	1st	2nd	3rd	4th	5th	6th
YIELD (Meat Pounds/Acre)				500	1200	1600
Planting costs						
Land Preparation - Backhoe (8 holes per hour)	351					
Fumigate - Custom Application	492	3	1			
Disk and Float - 2X	17					
Trees: 75 @ $5.05 (+2 2nd Year & 1 in 3rd Year)	285	8	4			
Survey and Plant trees	75	2	1			
TOTAL PLANTING COSTS	$1,220	$13	$6			
Cultural costs:						
Prune and Train		$19	$25	$37	$74	$74
Irrigate	$33	33	33	33	33	33
Fertilizer and Application	16	21	31	47	57	66
Pest Control - Dormant		29	46	46	46	46
Pest Control - Pinkbud				33	33	33
Pest Control - Shothole/Nutrient		16	19	40	40	40
Pest Control - Worm/Mite	14	19	23	57	57	57
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 Truck Use	56	56	56	56	56	56
TOTAL CULTURAL COSTS	$219	$293	$369	$525	$602	$611
Harvesting Costs:						
Shake				90	90	90
Pole					7	9
Sweep				7	16	21
Hand Rake				2	2	2
Pickup and Haul				26	63	97
Hull and Shell				25	60	80
TOTAL HARVEST COSTS				$150	$238	$299
Interest on operating capital @ 9%	53	9	10	22	27	28
Overhead Costs:						
Office Expense	30	30	30	30	30	30
ABC Assessment Fee				11	27	36
Leaf Analysis Fee	5	5	5	5	5	5
Property Taxes	61	61	61	61	61	61
Equipment Insurance	31	31	31	31	31	31
Investment Repairs	4	4	4	4	4	4
TOTAL OVERHEAD COSTS	$131	$131	$131	$142	$158	$167
TOTAL CASH COSTS	$1,623	$446	$516	$839	$1,025	$1,105
INCOME FROM PRODUCTION				$500	$1,200	$1,600
NET CASH COSTS FOR THE YEAR	$1,623	$446	$516	$339		
PROFIT ABOVE CASH COSTS					$175	$495
TOTAL ACCUMULATED NET CASH COSTS	$1,623	$2,069	$2,585	**$2,924**	$2,749	$2,254

Table 1. continued

	Costs per Acre					
YEAR	1st	2nd	3rd	4th	5th	6th
Depreciation:						
Buildings	14	14	14	14	14	14
Flood Irrigation System	19	19	19	19	19	19
Fuel Tanks & Pumps	4	4	4	4	4	4
Shop Tools	7	7	7	7	7	7
Equipment	44	44	44	44	44	44
TOTAL DEPRECIATION	$88	$88	$88	$88	$88	$88
Interest on Investment @ 4% :						
Buildings	9	9	9	9	9	9
Flood Irrigation System	10	10	10	10	10	10
Fuel Tanks & Pumps	2	2	2	2	2	2
Shop Tools	3	3	3	3	3	3
Land @ $5263/acre	211	211	211	211	211	211
Equipment	12	12	12	12	12	12
TOTAL INTEREST ON INVESTMENT	$247	$247	$247	$247	$247	$247
TOTAL COST FOR THE YEAR	$1,958	$781	$851	$1,174	$1,360	$1,440
INCOME FROM PRODUCTION				$500	$1,200	$1,600
TOTAL NET COST FOR THE YEAR	$1,958	$781	$851	$674	$160	
NET PROFIT ABOVE TOTAL COST						$160
TOTAL ACCUMULATED NET COST	$1,958	$2,739	$3,590	$4,264	$4,424	$4,264

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)	Cash and Labor Costs per Acre: Labor Cost	Fuel, Lube & Repairs	Material Cost	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	
Shread	0.30	3.86	1.73	0.00	0.00	5.59	
Weed Control - Winter Strip	0.30	3.86	1.27	61.17	0.00	66.30	
Pest Control - Dormant	0.40	5.15	4.98	36.23	0.00	46.35	
Remove Tree	1.00	6.70	0.00	0.00	14.25	20.95	
Plant Tree, Carton and 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	
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	
Irrigate	2.25	15.08	0.00	17.28	0.00	32.36	
Weed Control - Spring Spot	0.13	1.65	0.54	10.14	0.00	12.33	
Pest Control - Shot Hole/Nutrient	0.40	5.15	4.98	30.25	0.00	40.38	
Fertilizer and Application	0.80	10.29	2.01	50.00	10.00	72.30	
Miscellaneous - Attn Replants	0.25	1.67	0.00	2.25	0.00	3.92	
Mow Centers	1.75	22.51	10.08	0.00	0.00	32.59	
Rodent Control	0.10	1.29	0.22	1.50	0.00	3.00	
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	0.13	1.65	0.78	5.07	0.00	7.50	
Irrigate - Postharvest	0.25	1.67	0.00	1.92	0.00	3.60	
TOTAL CULTURAL COSTS	28.12	242.04	57.31	306.64	162.25	768.25	
Harvest:							
Shake	0.00	0.00	0.00	0.00	90.00	90.00	
Pole	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%						42.97	
TOTAL OPERATING COSTS/ACRE		255.78	57.31	306.64	483.50	1146.20	
TOTAL OPERATING COSTS/LB						0.57	
CASH OVERHEAD:							
Office Expense						30.00	
ABC Assessment Fee						45.00	
Property Taxes						76.36	
Property Insurance						38.18	
Investment Repairs						4.74	
TOTAL CASH OVERHEAD COSTS						194.28	
TOTAL CASH COSTS/ACRE						1340.49	
TOTAL CASH COSTS/LB						0.67	

NON-CASH OVERHEAD:

Investment	Per producing Acre	Annual Cost: Depreciation	Interest @ 4.00%		Your Cost
Buildings	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	
Orchard Establishment	2924.00	139.24	58.48	197.72	
Flood Irrigation System	432.34	19.46	9.51	28.97	
Pruning Equipment	12.63	1.14	0.28	1.41	
Equipment	621.66	51.77	13.68	65.45	
TOTAL NON-CASH OVERHEAD COSTS	9844.15	236.41	305.46	541.86	
TOTAL COSTS/ACRE				1882.35	
TOTAL COSTS/LB				0.94	

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
$6.70/hr. non-machine labor

Interest Rate: 9.00%

	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 ALMONDS				2000.00	
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	
Herbicide:					
Roundup	5.00	pint	5.07	25.35	
Surflan	3.00	pint	9.92	29.76	
Goal	1.00	qt	21.27	21.27	
Miticide:					
Dormant 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	pint	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 - replant	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	
Contract:					
Pollination fee	2.00	hive	30.00	60.00	
Leaf analysis	1.00	acre	0.50	0.50	
Irrigation:					
Water - district	40.00	acin	0.48	19.20	
Rent:					
Sprayer rental	2.00	acre	5.00	10.00	
Rodenticide:					
Strychnine bait	1.50	each	1.00	1.50	
Labor (machine)	10.45	hrs	10.72	111.99	
Labor (non-machine)	21.46	hrs	6.70	143.78	
Fuel - Gas	7.61	gal	0.98	7.46	
Fuel - Diesel	16.17	gal	0.71	11.48	
Lube				2.84	
Machinery repair				35.50	
Interest on operating capital @ 9.00%				42.97	
TOTAL OPERATING COSTS/ACRE				1146.20	
TOTAL OPERATING COSTS/LB				0.57	
NET RETURNS ABOVE OPERATING COSTS				853.80	
CASH OVERHEAD COSTS:					
Office Expense				30.00	
ABC Assessment Fee				45.00	
Property Taxes				76.36	
Property Insurance				38.18	
Investment Repairs				4.74	
TOTAL CASH OVERHEAD COSTS/ACRE				194.28	
TOTAL CASH COSTS/ACRE				1340.49	
TOTAL CASH COSTS/LB				0.67	

Table 4.

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

Beginning NOV 91 Ending 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
Shread		2.79	2.79										5.59
Weed Control - Winter Strip		22.21	22.05	22.05									66.30
Pest Control - Dormant		23.18	23.18										46.35
Remove Tree			20.95										20.95
Plant Tree, Carton and Tank			6.06										6.06
Burn Prunings			1.67										1.67
Pest Control - Pink Bud				33.47									33.47
Pollination				60.00									60.00
Irrigate				3.60		3.60	3.60	7.19	7.19	7.19			32.36
Weed Control - Spring Spot Spray					12.33								12.33
Pest Control - Shot Hole/Nutrient				40.38									40.38
Fertilizer and Application						23.65					48.65		72.30
Miscellaneous - Attn Replant						3.92							3.92
Mow Centers						4.66	4.66	4.66	18.63				32.59
Rodent Control							1.75		1.25				3.00
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	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	56.03
Weed control - Preharvest										7.50			7.50
Irrigate - Postharvest												3.60	3.60
TOTAL CULTURAL COSTS	86.62	99.85	128.37	166.11	18.95	42.45	16.62	24.77	95.90	23.12	55.27	10.21	768.25
Harvest:													
Shake											90.00		90.00
Pole											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	1.40	2.36	3.61	3.75	4.07	4.19	4.38	5.10	5.27	8.20		42.97
TOTAL OPERATING COSTS/ACRE	87.27	101.25	130.73	169.72	22.70	46.51	20.81	29.15	100.99	28.39	398.45	10.21	1146.20
TOTAL OPERATING COSTS/LB	0.04	0.05	0.07	0.08	0.01	0.02	0.01	0.01	0.05	0.01	0.20	0.01	0.57
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			38.18						38.18				76.36
Property Insurance			19.09						19.09				38.18
Investment Repairs	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39	4.74
TOTAL CASH OVERHEAD COSTS	2.89	2.89	60.17	2.89	2.89	2.89	2.89	2.89	60.17	2.89	47.89	2.89	194.28
TOTAL CASH COSTS/ACRE	90.17	104.14	190.90	172.61	25.59	49.41	23.71	32.05	161.16	31.29	446.35	13.11	1340.49
TOTAL CASH COSTS/LB	0.05	0.05	0.10	0.09	0.01	0.02	0.01	0.02	0.08	0.02	0.22	0.01	0.67

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	Interest	Cash Overhead - 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	Weed Sprayer 100 Gal	3424	10	308.20	75.32	9.41	18.83	411.76
TOTAL		98429		8197.16	2165.44	270.68	541.36	11174.64
60% of New Cost *		59057		4918.30	1299.26	162.41	324.82	6704.78

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

ANNUAL INVESTMENT COSTS

Yr	Description	Price	Yrs Life	- Non-Cash Over. - Depre-ciation	Interest	------ Cash Overhead ------ Insur-ance	Taxes	Repairs	Total
INVESTMENT									
	Buildings	37000	25	1332.00	814.00	101.75	203.50	100.00	2551.25
	Orchard Establishment	277780	21	13227.60	5555.60	694.45	1388.90	0.00	20866.55
	Flood Irrigation System	41072	20	1848.25	903.58	112.95	225.89	100.00	3190.67
	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
TOTAL INVESTMENT		876137		17540.35	27719.18	3464.91	6929.79	450.00	56104.23

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 - Non-Cash Over.- Depre-ciation	Interest	- Cash Overhead - Insur-ance	Taxes	-------- Operating -------- Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
92	30HP 2WD Tractor	128.3	5.08	1.86	0.23	0.47	1.09	1.20	2.29	9.92
92	60HP 2WD Tractor	457.5	2.08	0.76	0.10	0.19	1.58	2.41	3.99	7.12
92	ATV 4WD & Sprayer	10.5	35.94	8.79	1.10	2.20	0.83	1.13	1.96	49.98
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	152.0	7.13	1.39	0.17	0.35	8.05	0.00	8.05	17.10
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	Weed Sprayer 100 Gal	71.8	2.57	0.63	0.08	0.16	1.72	0.00	1.72	5.16

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	768	768	768	768	768	768	768
Harvest Cost	254	281	308	335	362	389	416
Interest on operating capital	42	43	43	43	43	43	44
TOTAL OPERATING COSTS/ACRE	1065	1092	1119	1146	1173	1201	1228
TOTAL OPERATING COSTS/LB	0.76	0.68	0.62	0.57	0.53	0.50	0.47
CASH OVERHEAD COSTS/ACRE	194	194	194	194	194	194	194
TOTAL CASH COSTS/ACRE	1259	1286	1313	1340	1368	1395	1422
TOTAL CASH COSTS/LB	0.90	0.80	0.73	0.67	0.62	0.58	0.55
NON-CASH OVERHEAD COSTS/ACRE	542	542	542	542	542	542	542
TOTAL COSTS/ACRE	1801	1828	1855	1882	1910	1937	1964
TOTAL COSTS/LB	1.29	1.14	1.03	0.94	0.87	0.81	0.76

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR ALMONDS

PRICE	YIELD (LB/ACRE)						
(DOLLARS PER LB)	1400	1600	1800	2000	2200	2400	2600
0.70	-85	28	141	254	367	479	592
0.80	55	188	321	454	587	719	852
0.90	195	348	501	654	807	959	1112
1.00	335	508	681	854	1027	1199	1372
1.10	475	668	861	1054	1247	1439	1632
1.20	615	828	1041	1254	1467	1679	1892
1.30	755	988	1221	1454	1687	1919	2152

NET RETURNS PER ACRE ABOVE CASH COSTS FOR ALMONDS

PRICE	YIELD (LB/ACRE)						
(DOLLARS PER LB)	1400	1600	1800	2000	2200	2400	2600
0.70	-279	-166	-53	60	172	285	398
0.80	-139	-6	127	260	392	525	658
0.90	1	154	307	460	612	765	918
1.00	141	314	487	660	832	1005	1178
1.10	281	474	667	860	1052	1245	1438
1.20	421	634	847	1060	1272	1485	1698
1.30	561	794	1027	1260	1492	1725	1958

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR ALMONDS

PRICE	YIELD (LB/ACRE)						
(DOLLARS PER LB)	1400	1600	1800	2000	2200	2400	2600
0.70	-821	-708	-595	-482	-370	-257	-144
0.80	-681	-548	-415	-282	-150	-17	116
0.90	-541	-388	-235	-82	70	223	376
1.00	-401	-228	-55	118	290	463	636
1.10	-261	-68	125	318	510	703	896
1.20	-121	92	305	518	730	943	1156
1.30	19	252	485	718	950	1183	1416

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	1146	854	1340	660	1882	118

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	108889	81111	127346	62654	178823	11177

BREAKEVEN PRICES PER YIELD UNIT

			Breakeven Price To Cover		
CROP	Base Yield (Units/Acre)	Yield Units	Operating Costs	Cash Costs	Total Costs
			$ per Yield Unit		
Almond	2000.0	lb	0.57	0.67	0.94

BREAKEVEN YIELDS PER ACRE

			Breakeven Yield To Cover		
CROP	Yield Units	Base Price ($/Unit)	Operating Costs	Cash Costs	Total Costs
			Yield Units / Acre		
Almond	lb	1.00	1146.2	1340.5	1882.4