UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2001

SAMPLE COSTS TO ESTABLISH AN OLIVE ORCHARD AND PRODUCE

OLIVE OIL

CENTRAL COAST REGION

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INTRODUCTION

The sample costs to establish an olive orchard and produce olives in the Central Coast of California are presented in this study. The study includes costs to grow olives, to process and market for oil by the grower, and costs to grow olives and sell to an oil processor. This study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on those production procedures considered typical for this crop and area, but will not apply to every situation. Sample costs for labor, materials, equipment and custom services are based on current figures. Some costs and practices presented in this study may not be applicable to your situation. A blank column, "*Your Costs*", is provided in Tables 4, 5, 9 and 10 to enter your costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-3589.

STUDY CONTENTS

Sample Cost of Production studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-1515. Current studies, those produced during the last five years, can be obtained from selected county UC Cooperative Extension offices or downloaded from the department website http//www.agecon.ucdavis.edu/outreach/crop/cost.htm.

ASSUMPTIONS

The following assumptions pertain to sample costs to establish an olive orchard, produce olives for oil, and to process and market olive oil in the Central Coast of California. Practices described are not recommendations by the University of California, but represent production practices and materials considered typical of a well managed orchard. Some costs, practices, and materials may not be applicable to your situation nor used during every year. Additional ones not indicated may be needed. Establishment and cultural practices vary by grower and region and variations can be significant. These costs are 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.*

Land. The hypothetical farm consists of 15 acres of land. An Olive orchard is being established on ten acres and the remaining five acres are roads, irrigation systems, unused land, and farmstead. Property costs $8,000 per acre or $12,000 per producing acre.

Trees. No specific olive cultivar is assumed in this study. Olive oil cultivars will produce between 40-45 gallons of oil per ton. Some of the cultivars historically planted in California include Mission, Sevillano, and Ascolano. Traditional European oil producing varieties that have been established in limited plantings in the region are Frantoio, Leccino, Pendolino, Maurino, Moraiolo, and Arbequina. The tree cost ranges from $5 to $15 per tree depending upon variety. An inclusive list of oil producing varieties and their characteristics can be found in the *Olive Production Manual*, DANR Publication 3353. The trees are planted on a 12' X 20' spacing, 180 trees per acre. Olive trees have a long production life if they are well maintained. The life of the orchard at the time of planting in this study is estimated to be 60 years.

Irrigation. The water cost for irrigation is the pumping charge. The cost per acre-foot for water will vary by grower in the region depending on well characteristics and other irrigation factors. In this study, water is calculated to cost $75.96 per acre-foot. Irrigation rates, shown in Table A, increase each year as the orchard matures. One acre-foot of water is assumed to be available from rainfall. Because the orchard is planted on sloped land, water is delivered to the orchard by microsprinklers in the tree row.

Table A. Olive Orchard Water Use

Year	Acre-Feet/Year
1	0.3
2	0.7
3	1.5
4+	2.5

Orchard Establishment Cultural Practices and Material Inputs

Site Preparation. Land preparation begins with subsoiling the soil to a depth of 12–18 inches to break up surface compaction. The ground is then disced twice to break up large clods and smooth the surface. Custom operators do the subsoiling and discing. All operations that prepare the orchard for planting are done in the year prior to planting. In this study, the costs are included in the first year.

Planting. In the spring, the tree sites are marked, holes dug, and the trees planted. Later the trees are wrapped with white, water-resistant guards to protect the trees from sunburn and herbicides, staked and tied. In the second year, one tree per acre is replanted.

Pruning. Regular pruning begins in the spring of the fourth year. As the trees grow, the pruning time and costs will increase. Newly planted trees should have a single trunk and 3-4 main scaffold branches at a height of approximately 36 inches.

Weed Management. Pre-emergent herbicides, Surflan and Devrinol, are applied immediately after planting. In the spring and summer three applications of a contact herbicide, Roundup, are made to control perennial weeds. In the first fall a pre-emergent herbicide, Surflan, is sprayed along the tree rows to control weeds the following season. In the summer of the second year a combination of pre-emergent and contact herbicides, Karmex, Princep, Roundup, are used to control weeds in the tree rows. Mowing the row middles to manage the orchard floor also starts the first year. The orchard is mowed three times each year.

Insect and Disease Management. Control of insects and diseases in olive orchards is mimimal during the orchard establishment period and are not shown in this study. Occasional control may be needed for the black scale insect. Peacock spot and olive knot are the major olive diseases that infect leaves and shoots, causing defoliation and shoot death. Control if necessary begins in the fourth year.

Fertilization. Nitrogen is the major nutrient required for proper tree growth and optimum yields. Young trees receive approximately 50% of the mature tree rate applied 3 to 4 times during the growing season. Granular Urea a nitrogen fertilizer is applied at increasing rates during orchard establishment and is shown in Table B.

Table B. Applied Nitrogen for Olives

Year	Pounds of N	Pounds of Urea
	---------- per acre ----------	
1	6	13
2	11	24
3	23	50
4	45	98
5+	*90	196

* Rate is applied every other year.

Production Cultural Practices and Material Inputs

Pruning. Pruning is done to manipulate tree growth for maximum fruit production. Tree density, hand or mechanical harvest, age of tree, diseases and insect control and fruit size are some of the factors that affect pruning decisions. Pruning is done by hand in the spring after the winter rains. This reduces the risk of diseases, infections and insect attack. The prunings are placed in the row middles and shredded.

Fertilization. Mature tree nutrition is determined by leaf analysis in July. In April, nitrogen as Urea is applied at a rate of one pound of nitrogen per tree every two years. In this study 1/2 of the fertilizer cost and rate is shown each year.

Pest Management. For specific pesticide choices and rates consult the *UC IPM Pest Management Guidelines: Olives,* and the *Olive Production Manual*. For more information on pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. Written recommendations are required for many pesticides and are made by licensed pest control advisors. For information and pesticide use permits, contact the local county agricultural commissioner's office. Contact your county farm advisor for additional production information.

Weed Control. Weeds in mature orchards are controlled with chemicals and mowing. Weeds within the tree rows are controlled with residual pre-emergent herbicides, Surflan and Princep, applied in the fall. During the growing season three spot sprays with a contact herbicide, Roundup, are made in the tree row. Row centers are mowed three times during the spring and summer.

Insect and Disease Management. The black scale insect, peacock spot and olive knot diseases are a concern to olive growers, but are not included in the study. Pruning will control the black scale insect in most years. Following cool years or in orchards that have become dense, an insecticide treatment may be required to reduce the population to manageable levels. To prevent the fungal disease, peacock spot, and the bacterial disease, olive knot, an annual copper spray following harvest and prior to fall rains is recommended. The disease is sporadic and may take several years to have a severe effect. Olive oil processors are generally unwilling to accept fruit treated with copper, and the late olive harvest will present some application problems.

Harvest. Harvest starts in the fourth year and is done by a contracted harvesting company. Costs for contracted harvest operations are based on fresh tons. Olives for oil are hand picked at the color change stage of purple/black skin and green flesh in December and January. Care must be taken when harvesting olives because damaged or groundfall fruit can spoil, and develop undesired odors and flavors that are imparted to the oil. Frost can also damage olive fruit and lower oil quality.

Processing and Marketing. Processing olives for oil requires special equipment and expertise. Some growers process the olives in their own facilities. The two major options for growers without production facilities are to sell the olives to a processor or pay to have the olives processed and then market the olive oil themselves. Costs and returns for oil that is produced and sold by the grower are shown in Tables 3-8 and the production costs and returns for olives sold to an oil processor are presented in Tables 9-11. A description of

the different processing procedures is described in the *Olive Production Manual*, DANR Publication 3353 and *Producing Olive Oil in California*, DANR Publication 21516.

Marketing costs include distribution, possible slotting fees and promotional materials. Because of the locally high cost of producing olives and the competition from lower price imported olive oils that dominate the low and medium quality olive oil markets, California produced olive oil is marketed as a high quality product and sold for a premium price. Selling olive oil in the gourmet market requires careful consideration. Product packaging and developing a market channel are essential to succeed in the competitive oil marketplace. In this study, the cost of processing and packaging is included as a cost of producing olive oil in the processing and marketing cost section of Tables 4-8. Marketing costs are shown as a separate expense under processing and marketing costs in Table 1.

Yields. As noted in the previous section, olives begin bearing an economic crop in the fourth year after planting and maximum yield is reached in the sixth year. In this study, olives yield 19% oil per fresh weight and the oil weighs 7.61 pounds per gallon. With a 90% extraction rate about 45 gallons of oil per ton of olives is produced. A case of olive oil consists of 12 - 500 milliliter bottles. Typical annual yields for olives are measured in tons per acre. Tonnage, oil, and case yields are shown in Table C.

Table C. Annual Yield for Establishment and Production Years

Year	Tons (Fresh Weight)	Gallons Oil	Cases
	---------- per acre ----------		
4	0.5	22.5	14.2
5	1.0	44.9	28.4
6	2.0	89.9	56.7
7+	2.5	112.4	70.9

Returns. Growers can market their olives in different ways. This study looks at two approaches; the grower processes and markets their oil (Tables 4-8) versus the grower selling raw olives to an oil processor (Tables 9-12). The yields and prices used in this cost study are an estimate based on past and current markets. For grower processed and marketed oil, a price of $120 per case of olive oil is used in Table 5. A range from $80 to $140 per case is used in Table 7.

Growers selling their olives for processing typically receive in the range of $350 to $500 per ton and, on rare occasions, upwards of $1,000 per ton for certain olive varieties. A price of $400 per ton is used in Tables 10 and 11 which is similar to the price paid for canning olives. Table 11 includes a range from $350 to $500 per ton.

Labor. Hourly wages for workers are $9.80 and $7.35 per hour for skilled and field workers, respectively. Adding 34% for the employers share of federal and state payroll taxes, and other possible benefits gives the labor rates shown of $13.13 per hour for skilled labor, and $9.85 per hour for field labor. Labor for operations involving machinery are 20% higher than the operation time given in Table 4 and 9 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and repair.

Risk. The risks associated with producing and marketing olive oil are significant. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks which affect the profitability and economic viability of olive oil production. A market channel should be determined before olives are planted and brought into production. Though, not used in this study, crop insurance is a risk management tool available to growers.

Overhead Costs

Cash Overhead. Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, management services, and equipment repairs.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis. Costs and salvage value for investments are shown in Table 2.

Interest On Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 10.51% per year. A nominal interest rate is the typical rate for borrowed funds.

Management. Wages for management are not included in this study. Any return above total costs is considered a return to management.

Insurance. Insurance for farm investments vary depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.666% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $410 for the farm.

Office Expense. Office and business expenses are estimated at $4000 annually. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, etc.

Capital Recovery Costs. Although farm equipment on olive orchards in the region might be purchased new or used, this study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in the various tables. They represent the capital recovery cost for investments on an annual per acre basis.

Capital recovery cost is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). Put another way, it is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The calculation for the annual capital recovery costs is as follows:

$$\left[\left(\text{Purchase Price} - \text{Salvage Value}\right) \times \left(\text{Capital Recovery Factor}\right)\right] + \left[\text{Salvage Value} \times \text{Interest Rate}\right]$$

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (e.g., tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wearout life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is equal to the purchase price because land does not depreciate. The purchase price and salvage value for certain equipment and investments are shown in Table 5.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate and the life of the equipment.

Interest Rate. The interest rate of 6.70% used to calculate capital recovery cost is the USDA-ERS's ten-year average of California's agricultural sector long-run rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Establishment Cost. The establishment cost is the sum of cash costs for land preparation, planting, trees, production expenses, and cash overhead for growing olive trees through the first year oil is produced minus any returns. The *Total Accumulated Net Cash Cost* in the fourth year shown in Table 1, represents the establishment cost per acre. For this study, the cost is $7,745 per acre or $77,450 for the 10 acres planted to olives. Establishment cost is amortized over the remaining 56 years that the orchard is assumed to be in production. Establishment cost is used to determine the non-cash overhead, orchard capital recovery expense for production years.

Irrigation System. The cost of the irrigation system includes drilling a 6-inch well, installation of a submersible 10 hp pump, control valves, electrical panel, and filters. Pumping costs are based on delivering 30-acre inches to the orchard from a 300-foot well, pumping from a 250 foot depth and 30 psi operating pressure. The irrigation system is installed and completed before the trees are planted. The pump, filter station, mainlines, laterals, and risers have an expected useful life of 40 years. The life of the microsprinklers is estimated at 10 years. The irrigation system is considered an improvement to the property and is shown in the capital recovery or investment sections of the tables.

Equipment Costs. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of fuel, lubrication, and repairs. In allocating the equipment costs on a per acre basis, the hourly charges are calculated and shown in Table 5.

Repairs, Fuel and Lube. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO hp, and type of fuel used. The fuel and repair cost per acre for each operation in Tables 4 and 9 is determined by multiplying the total hourly operating cost in Table 3 for each piece of equipment used for the cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time. Prices for on-farm delivery of diesel and gasoline are $1.26 and $1.51 per gallon,

Table Values. Due to rounding, the totals may be slightly different from the sum of the components.

Acknowledgment. Appreciation is expressed to those cooperators who provided support for this study.

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Table 1. COSTS PER ACRE TO ESTABLISH AN OLIVE ORCHARD
CENTRAL COAST - 2001

	Cost Per Acre					
Year	1st	2nd	3rd	4th	5th	6th
Fresh Tons Per Acre				0.5	1.0	2.0
Gallons Per Acre (19% oil & 90% extraction 1st press)				22.5	44.9	89.9
Cases Per Acre (12 - 500 ml bottles per case)				14.2	28.4	56.7
Planting Costs:						
Land Preparation - Subsoil	125					
Land Preparation - Disc	50					
Trees: 180 Per Acre (1% in 2nd year)	1,440	16				
Survey, Mark, Dig Holes & Plant	720	8				
Wrap, Stake, Tie Trees	224					
Weed Control - Pre-emergent Strip Spray	53					
TOTAL PLANTING COSTS	2,612	24				
Cultural Costs:						
Pruning And Suckering	11	17	17	180	270	360
Brush Disposal				21	21	21
Irrigate	31	61	122	198	198	198
Fertilizer - Nitrogen	12	13	17	17	25	25
Weed Control - Summer Residual Herbicide		14				
Weed Control - Spot Spray 3X	19	20	19	19	19	19
Weed Control - Mow Centers 3X	27	27	27	27	27	27
Weed Control - Dormant Residual Herbicide	29	38	12	12	12	12
Pickup Truck Use	175	175	175	175	175	175
TOTAL CULTURAL COSTS	304	365	389	649	747	837
Harvest Costs:						
Hand Pick Olives				175	350	700
TOTAL HARVEST COSTS	0	0	0	175	350	700
Interest On Operating Capital @ 10.51%	296	21	23	64	36	32
TOTAL OPERATING COSTS/ACRE	3,212	410	412	888	1,133	1,569
Cash Overhead Costs:						
Office Expense	400	400	400	400	400	400
Liability Insurance	41	41	41	41	41	41
Property Taxes	157	158	157	157	157	160
Property Insurance	105	105	105	105	105	107
Investment Repairs	65	65	65	65	65	65
TOTAL CASH OVERHEAD COSTS	768	769	768	768	768	773
TOTAL CASH COSTS/ACRE	3,980	1,179	1,180	1,656	1,902	2,335
INCOME/ACRE FROM PRODUCTION	0	0	0	250	500	1,000
NET CASH COSTS/ACRE FOR THE YEAR	3,980	1,179	1,180	1,402	1,401	1,335
PROFIT/ACRE ABOVE CASH COSTS	0	0	0	0	0	0
ACCUMULATED NET CASH COSTS/ACRE	3,980	5,159	6,339	**7,745**	9,147	10,482
Capital Recovery Cost:						
Land @ $12,000/Producing Acre	804	804	804	804	804	804
Shop Building	138	138	138	138	138	138
Irrigation System	141	141	141	141	141	141
Shop Tools	36	36	36	36	36	36
Pruning Tools	7	7	7	7	7	7
Equipment	337	358	337	321	337	392
TOTAL CAPITAL RECOVERY COST	1,463	1,484	1,463	1,447	1,463	1,518
TOTAL COST/ACRE FOR THE YEAR	5,443	2,663	2,643	3,103	3,365	3,853
TOTAL COST/CASE FOR THE YEAR				219	119	68
INCOME/ACRE FROM PRODUCTION	0	0	0	250	500	1,000
TOTAL NET COST/ACRE FOR THE YEAR	5,443	2,663	2,643	2,853	2,865	2,853
NET PROFIT/ACRE ABOVE TOTAL COST	0	0	0	0	0	0
TOTAL ACCUMULATED NET COST/ACRE	5,443	8,106	10,749	13,602	16,467	19,320
Processing and Marketing Costs:						
Press, Process, Bottle, Label & Cork				654	1,308	2,613
Market Olive Oil				312	625	1,247
TOTAL PROCESSING AND MARKETING COSTS	0	0	0	966	1,933	3,860

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Table 2. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, and BUSINESS OVERHEAD COSTS
CENTRAL COAST 2001

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead - Insur-ance	Taxes	Total
01	55 HP 4WD Tractor	31,102	12	7,776	3,411	129	194	3735
01	Mower - Flail 9'	7,372	10	1,304	939	29	43	1012
01	Pickup Truck - 1/2 Ton	24,500	7	9,294	3,415	113	169	3696
01	Weed Sprayer - 50 Gal	1,500	15	144	156	5	8	169
	TOTAL	64,474		18,518	7,921	276	415	8612
	60% of New Cost *	38,684		11,111	4,753	166	249	5167

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

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	-------- Cash Overhead -------- Insur-ance	Taxes	Repairs	Total
INVESTMENT								
Buildings	15,000	20		1,383	50	75	450	1,958
Irrigation System	19,500	40		1,412	65	98	98	1,672
Land	120,000	60	120,000	8,040	799	1,200	0	10,039
Olive Orchard Establishment	77,530	56		5,336	258	388	0	5,982
Pruning Tools	200	3	20	70	1	1	50	121
Shop Tools	3,500	15	350	363	13	19	47	442
TOTAL INVESTMENT	235,730		120,370	16,603	1,186	1,781	645	20,214

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	15	acre	27.33	410
Office Expense	10	acre	400.00	4,000

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Table 3. HOURLY EQUIPMENT COSTS for OLIVES
CENTRAL COAST 2001

Yr	Description	Actual Hours Used	COSTS PER HOUR - Capital Recovery	- Cash Overhead - Insur-ance	Taxes	Repairs	-------- Operating -------- Fuel & Lube	Total Oper.	Total Costs/Hr.
01	55 HP 4WD Tractor	23.60	86.70	3.29	4.94	0.59	3.91	4.50	99.43
01	Mower - Flail 9'	11.50	49.18	1.51	2.27	3.03	0.00	3.03	56.00
01	Pickup Truck 1/2 Ton	245.00	8.36	0.28	0.41	1.79	4.34	6.13	15.19
01	Weed Sprayer 50 Ga	10.00	9.34	0.33	0.49	0.39	0.00	0.39	10.55

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Table 4. COSTS TO PRODUCE, PROCESS, MARKET OLIVES

CENTRAL COAST 2001

Operation	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
		---------- Cash and Labor Costs per Acre ----------					
Cultural:							
Irrigate	0.80	8	0	250	0	258	
Weed Control - Spot Spray 3X	0.75	12	4	5	0	21	
Pruning & Sucker	0.00	0	0	0	360	360	
Weed Control - Mow Middles 3X	1.15	18	9	0	0	27	
Fertilizer - Nitrogen	1.00	10	0	13	0	22	
Brush Disposal	0.00	0	0	0	21	21	
Weed Control – Pre emergent	0.25	4	1	18	0	23	
Pickup Truck Use	8.00	126	49	0	0	175	
TOTAL CULTURAL COSTS	11.95	178	64	285	381	907	
Harvest:							
Hand Pick	0.00	0	0	0	875	875	
TOTAL HARVEST COSTS					875	875	
Process/Market:							
Press & Process Olive Oil	0.00	0	0	3,270	0	3,270	
Marketing	0.00	0	0	1,562	0	1,562	
TOTAL PROCESS/MARKET COSTS	0.00	0	0	4,832	0	4,832	
Interest on operating capital @ 10.51%						13	
TOTAL OPERATING COSTS/ACRE		178	64	5,118	1,256	6,628	
CASH OVERHEAD:							
Office Expense						400	
Liability Insurance						41	
Property Taxes						196	
Property Insurance						131	
Investment Repairs						65	
TOTAL CASH OVERHEAD COSTS						832	
TOTAL CASH COSTS/ACRE						7,460	
CAPITAL RECOVERY COSTS:							
Investment		Per producing Acre		-- Annual Cost -- Capital Recovery			
Land		12,000		804		804	
Buildings		1,500		138		138	
Irrigation System		1,950		141		141	
Shop Tools		350		36		36	
Pruning Tools		20		7		7	
Olive Oil Establishment		7,753		534		534	
Equipment		2,878		337		337	
TOTAL NON-CASH OVERHEAD COSTS		26,451		1,998		1,998	
TOTAL COSTS/ACRE						9,563	

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Table 5. COSTS and RETURNS to PRODUCE, PROCESS, MARKET OLIVES
CENTRAL COAST 2001

	Quantity /Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Olive Oil	71.00	case	120.00	8,520	
TOTAL GROSS RETURNS FOR OLIVE OIL				8,520	
OPERATING COSTS					
Irrigation:					
Water	30.00	acin	8.33	250	
Herbicide:					
Roundup Ultra	0.60	pint	7.84	5	
Karmex DF	2.00	lb	4.84	10	
Princep Caliber 90	2.00	lb	4.22	8	
Custom:					
Prune Trees	180.00	tree	2.00	360	
Shred Brush	1.00	acre	21.00	21	
Hand Pick Fruit	2.50	ton	350.00	875	
Fertilizer:					
46-0-0	45.00	lb N	0.28	13	
Packaging:					
Press & Process	2.50	ton	300.00	750	
Bottling Charge	71.00	case	3.50	249	
Bottle	71.00	case	25.00	1,775	
Label & Cork	71.00	case	7.00	497	
Marketing Charge	71.00	case	22.00	1,562	
Labor (machine)	12.18	hrs	13.13	160	
Labor (non-machine)	1.80	hrs	9.85	18	
Fuel - Gas	20.03	gal	1.51	30	
Fuel - Diesel	6.37	gal	1.26	8	
Lube				6	
Machinery repair				20	
Interest on operating capital @ 10.51%				13	
TOTAL OPERATING COSTS/ACRE				6,628	
NET RETURNS ABOVE OPERATING COSTS				1,892	
CASH OVERHEAD COSTS:					
Office Expense				400	
Liability Insurance				41	
Property Taxes				196	
Property Insurance				131	
Investment Repairs				65	
TOTAL CASH OVERHEAD COSTS/ACRE				832	
TOTAL CASH COSTS/ACRE				7,565	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Land				804	
Buildings				138	
Irrigation System				141	
Shop Tools				36	
Pruning Tools				7	
Olive Orchard Establishment				533	
Equipment				337	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,997	
TOTAL COSTS/ACRE				9,547	
NET RETURNS ABOVE TOTAL COSTS				-937	

UC COOPERATIVE EXTENSION

Table 6. MONTHLY CASH COSTS to PRODUCE, PROCESS, MARKET OLIVES
CENTRAL COAST 2001

Beginning MAR 01 Ending FEB 02	MAR 01	APR 01	MAY 01	JUN 01	JUL 01	AUG 01	SEP 01	OCT 01	NOV 01	DEC 01	JAN 02	FEB 02	TOTAL
Cultural:													
Irrigate	18	23	33	38	51	46	28	18					258
Weed Control - Spot Spray	7	7		7									21
Pruning & Sucker		180	180										360
Weed Control - Mow Middle		9	9	9									27
Fertilizer - Nitrogen		22											22
Brush Disposal			21										21
Weed Control – Pre emergent								23					23
Pickup Truck Use	15	15	15	15	15	15	15	15	15	15	15	15	175
TOTAL CULTURAL COSTS	40	256	258	69	66	61	43	56	15	15	15	15	907
Harvest:													
Hand Pick										438	438		875
TOTAL HARVEST COSTS										438	438		875
Processing/Marketing:													
Press & Process Olive Oil											3,270		3,270
Marketing											1,562		1,562
TOTAL PROCESS/MARKET COSTS											4,832		4,832
Interest on operating capital	0	3	5	5	6	7	7	7	8	12	-46	0	13
TOTAL OPERATING COSTS/ACRE	40	259	263	74	72	67	50	64	22	464	5,238	14	6,628
OVERHEAD:													
Office Expense	33	33	33	33	33	33	33	33	33	33	33	33	400
Liability Insurance	41												41
Property Taxes					98						98		196
Property Insurance					65						65		131
Investment Repairs	5	5	5	5	5	5	5	5	5	5	5	5	65
TOTAL CASH OVERHEAD COSTS	80	39	39	39	202	39	39	39	39	39	202	39	832
TOTAL CASH COSTS/ACRE	120	298	302	113	274	106	89	103	61	502	5,440	53	7,460

UC COOPERATIVE EXTENSION

Table 7. RANGING ANALYSIS to PRODUCE, PROCESS, MARKET OLIVES
CENTRAL COAST 2001

	YIELD(case/acre)						
	40	50	60	70	80	90	100
OPERATING COSTS/ACRE:							
Cultural Cost	907	907	907	907	907	907	907
Harvest Cost	3,215	4,019	4,823	5,627	6,431	7,235	8,039
Interest on operating capital	31	25	19	13	7	1	-5
TOTAL OPERATING COSTS/ACRE	4,154	4,952	5,750	6,548	7,346	8,144	8,942
TOTAL OPERATING COSTS/CASE	104	99	96	94	92	90	89
CASH OVERHEAD COSTS/ACRE	832	832	832	832	832	832	832
TOTAL CASH COSTS/ACRE	4,986	5,784	6,582	7,380	8,178	8,976	9,774
TOTAL CASH COSTS/CASE	125	116	110	105	102	100	98
NON-CASH OVERHEAD COSTS/ACRE	1,997	1,997	1,997	1,997	1,997	1,997	1,997
TOTAL COSTS/ACRE	6,983	7,781	8,579	9,377	10,175	10,973	11,771
TOTAL COSTS/CASE	175	156	143	134	127	122	118

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR PROCESSED OLIVE OIL

PRICE (dollars/case)	YIELD (case/acre)						
Olive Oil	40	50	60	70	80	90	100
80.00	-954	-952	-950	-948	-946	-944	-942
90.00	-554	-452	-350	-248	-146	-44	58
100.00	-154	48	250	452	654	856	1,058
110.00	246	548	850	1,152	1,454	1,756	2,058
120.00	646	1,048	1,450	1,852	2,254	2,656	3,058
130.00	1,046	1,548	2,050	2,552	3,054	3,556	4,058
140.00	1,446	2,048	2,650	3,252	3,854	4,456	5,058

NET RETURNS PER ACRE ABOVE CASH COSTS FOR PROCESSED OLIVE OIL

PRICE (dollars/case)	YIELD (case/acre)						
Olive Oil	40	50	60	70	80	90	100
80.00	-1,786	-1,784	-1,782	-1,780	-1,778	-1,776	-1,774
90.00	-1,386	-1,284	-1,182	-1,080	-978	-876	-774
100.00	-986	-784	-582	-380	-178	24	226
110.00	-586	-284	18	320	622	924	1,226
120.00	-186	216	618	1,020	1,422	1,824	2,226
130.00	214	716	1,218	1,720	2,222	2,724	3,226
140.00	614	1,216	1,818	2,420	3,022	3,624	4,226

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR PROCESSED OLIVE OIL

PRICE (dollars/case)	YIELD (case/acre)						
Olive Oil	40	50	60	70	80	90	100
80.00	-3,783	-3,781	-3,779	-3,777	-3,775	-3,773	-3,771
90.00	-3,383	-3,281	-3,179	-3,077	-2,975	-2,873	-2,771
100.00	-2,983	-2,781	-2,579	-2,377	-2,175	-1,973	-1,771
110.00	-2,583	-2,281	-1,979	-1,677	-1,375	-1,073	-771
120.00	-2,183	-1,781	-1,379	-977	-575	-173	229
130.00	-1,783	-1,281	-779	-277	225	727	1,229
140.00	-1,383	-781	-179	423	1,025	1,627	2,229

UC COOPERATIVE EXTENSION

Table 8. COSTS and RETURNS/BREAKEVEN ANALYSIS to PRODUCE, PROCESS, MARKET OLIVES
CENTRAL COAST 2001

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)
Olive Oil	8,520	6,628	1,892	7,460	1,060	9,457	-937

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)
Olive Oil	85,200	66,277	18,923	74,599	10,601	94,569	-9,369

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		
Olive Oil	71	Case	93.35	105.07	133.20

BREAKEVEN YIELD PER ACRE

			Breakeven Yield to Cover		
CROP	Yield Units	Base Price ($/Unit)	Operating Costs	Cash Costs	Total Costs
			Yield Units/acre		
Olive Oil	Case	120.00	55.20	62.20	78.80

UC COOPERATIVE EXTENSION

Table 9. COSTS to PRODUCE OLIVES SOLD to OIL PROCESSOR

CENTRAL COAST 2001

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:							
Irrigate	0.80	8	0	250	0	258	
Weed Control - Spot Spray 3X	0.75	12	4	5	0	21	
Pruning & Sucker	0.00	0	0	0	360	360	
Weed Control - Mow Middles 3X	1.15	18	9	0	0	27	
Fertilizer - Nitrogen	1.00	10	0	13	0	22	
Brush Disposal	0.00	0	0	0	21	21	
Weed Control – Pre emergent	0.25	4	1	18	0	23	
Pickup Truck Use	8.00	126	49	0	0	175	
TOTAL CULTURAL COSTS	11.95	178	64	285	381	907	
Harvest:							
Hand Pick	0.00	0	0	0	875	875	
TOTAL HARVEST COSTS	0.00	0	0	0	875	875	
Interest on operating capital @ 10.51%						55	
TOTAL OPERATING COSTS/ACRE		178	64	285	1,256	1,838	
CASH OVERHEAD:							
Office Expense						400	
Liability Insurance						41	
Property Taxes						196	
Property Insurance						131	
Investment Repairs						65	
TOTAL CASH OVERHEAD COSTS						832	
TOTAL CASH COSTS/ACRE						2,670	
CAPITAL RECOVERY COSTS:							
Investment:		Per producing Acre		-- Annual Cost -- Capital Recovery			
Land		12,000		804		804	
Buildings		1,500		138		138	
Irrigation System		1,950		141		141	
Shop Tools		350		36		36	
Pruning Tools		20		7		7	
Olive Orchard Establishment		7,745		533		533	
Equipment		2,878		337		337	
TOTAL NON-CASH OVERHEAD COSTS		26,443		1,997		1,997	
TOTAL COSTS/ACRE						4,667	

UC COOPERATIVE EXTENSION

Table 10. COSTS and RETURNS to PRODUCE OLIVES SOLD to OIL PROCESSOR
CENTRAL COAST 2001

	Quantity /Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Olives sold to processor	2.50	ton	400.00	1,000	
TOTAL GROSS RETURNS FOR OLIVE SOLD				1,000	
OPERATING COSTS					
Irrigation:					
Water	30.00	acin	8.33	250	
Herbicide:					
Roundup Ultra	0.60	pint	7.84	5	
Karmex DF	2.00	lb	4.84	10	
Princep Caliber 90	2.00	lb	4.22	8	
Custom:					
Prune Trees	180.00	tree	2	360	
Shred Brush	1.00	acre	21	21	
Hand Pick Fruit	2.50	ton	350.00	875	
Fertilizer:					
46-0-0	45.00	lb N	0.28	13	
Labor (machine)	12.18	hrs	13.13	160	
Labor (non-machine)	1.80	hrs	9.85	18	
Fuel - Gas	20.03	gal	1.51	30	
Fuel - Diesel	6.37	gal	1.26	8	
Lube				6	
Machinery repair				20	
Interest on operating capital @ 10.51%				55	
TOTAL OPERATING COSTS/ACRE				1,838	
NET RETURNS ABOVE OPERATING COSTS				-838	
CASH OVERHEAD COSTS:					
Office Expense				400	
Liability Insurance				41	
Property Taxes				196	
Property Insurance				131	
Investment Repairs				65	
TOTAL CASH OVERHEAD COSTS/ACRE				832	
TOTAL CASH COSTS/ACRE				2,670	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Land				804	
Buildings				138	
Irrigation System				141	
Shop Tools				36	
Pruning Tools				7	
Olive Orchard Establishment				533	
Equipment				337	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,997	
TOTAL COSTS/ACRE				4,667	
NET RETURNS ABOVE TOTAL COSTS				-3,667	

UC COOPERATIVE EXTENSION

Table 11. RANGING ANALYSIS to PRODUCE OLIVES SOLD to OIL PROCESSOR

CENTRAL COAST 2001

	YIELD (ton/acre)						
	2.00	2.25	2.50	2.75	3.00	3.25	3.50
OPERATING COSTS/ACRE:							
Cultural Cost	907	907	907	907	907	907	907
Harvest Cost	700	788	875	963	1,050	1,138	1,225
Interest on operating capital	55	55	55	55	55	55	55
TOTAL OPERATING COSTS/ACRE	1,663	1,750	1,838	1,925	2,013	2,100	2,188
TOTAL OPERATING COSTS/TON	831	778	735	700	671	646	625
CASH OVERHEAD COSTS/ACRE	832	832	832	832	832	832	832
TOTAL CASH COSTS/ACRE	2,495	2,582	2,670	2,757	2,845	2,932	3,020
TOTAL CASH COSTS/TON	1,247	1,148	1,068	1,003	948	902	863
NON-CASH OVERHEAD COSTS/ACRE	1,997	1,997	1,997	1,997	1,997	1,997	1,997
TOTAL COSTS/ACRE	4,492	4,579	4,667	4,754	4,842	4,929	5,017
TOTAL COSTS/TON	2,246	2,035	1,867	1,729	1,614	1,517	1,433

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR OLIVES SOLD FOR OIL

PRICE (dollars/ton)	YIELD (ton/acre)						
Olives	2.00	2.25	2.50	2.75	3.00	3.25	3.50
350.00	-963	-963	-963	-963	-963	-963	-963
375.00	-913	-906	-900	-894	-888	-881	-875
400.00	-863	-850	-838	-825	-813	-800	-788
425.00	-813	-794	-775	-756	-738	-719	-700
450.00	-763	-738	-713	-688	-663	-638	-613
475.00	-713	-681	-650	-619	-588	-556	-525
500.00	-663	-625	-588	-550	-513	-475	-438

NET RETURNS PER ACRE ABOVE CASH COSTS FOR OLIVES SOLD FOR OIL

PRICE (dollars/ton)	YIELD (ton/acre)						
Olives	2.00	2.25	2.50	2.75	3.00	3.25	3.50
350.00	-1,795	-1,795	-1,795	-1,795	-1,795	-1,795	-1,795
375.00	-1,745	-1,738	-1,732	-1,726	-1,720	-1,713	-1,707
400.00	-1,695	-1,682	-1,670	-1,657	-1,645	-1,632	-1,620
425.00	-1,645	-1,626	-1,607	-1,588	-1,570	-1,551	-1,532
450.00	-1,595	-1,570	-1,545	-1,520	-1,495	-1,470	-1,445
475.00	-1,545	-1,513	-1,482	-1,451	-1,420	-1,388	-1,357
500.00	-1,495	-1,457	-1,420	-1,382	-1,345	-1,307	-1,270

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR OLIVES SOLD FOR OIL

PRICE (dollars/ton)	YIELD (ton/acre)						
Olives	2.00	2.25	2.50	2.75	3.00	3.25	3.50
350.00	-3,792	-3,792	-3,792	-3,792	-3,792	-3,792	-3,792
375.00	-3,742	-3,735	-3,729	-3,723	-3,717	-3,710	-3,704
400.00	-3,692	-3,679	-3,667	-3,654	-3,642	-3,629	-3,617
425.00	-3,642	-3,623	-3,604	-3,585	-3,567	-3,548	-3,529
450.00	-3,592	-3,567	-3,542	-3,517	-3,492	-3,467	-3,442
475.00	-3,542	-3,510	-3,479	-3,448	-3,417	-3,385	-3,354
500.00	-3,492	-3,454	-3,417	-3,379	-3,342	-3,304	-3,267

UC COOPERATIVE EXTENSION

Table 12. COSTS and RETURNS/BREAKEVEN ANALYSIS to PRODUCE OLIVES SOLD to OIL PROCESSOR
CENTRAL COAST 2001

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)
Olives for Oil	1,000	1,838	-838	2,670	1,670	4,667	-3,667

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)
Olives for Oil	10,000	18,375	-8,375	26,697	-16,697	46,667	-36,667

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	Breakeven Price to Cover Operating Costs	Cash Costs	Total Costs
			$ per Yield Unit		
Olives for Oil	2.50	Ton	735.01	1,067.88	1,866.69

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price ($/Unit)	Breakeven Price to Cover Operating Costs	Cash Costs	Total Costs
			Yield Units/acre		
Olives for Oil	Ton	400.00	4.60	6.70	11.70