
1997

UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

SAMPLE COSTS
TO ESTABLISH AN OLIVE ORCHARD AND PRODUCE

~OLIVES~



**GLENN AND TEHAMA COUNTIES
MANZANILLO VARIETY - FLOOD IRRIGATED**

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UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

**SAMPLE COSTS FOR
ESTABLISHING A MANZANILLO OLIVE ORCHARD AND PRODUCING OLIVES
Glenn and Tehama Counties - 1997**

INTRODUCTION

Detailed costs of establishing a Manzanillo olive orchard and production of Manzanillo olives in Glenn and Tehama Counties are presented in this study. The hypothetical farm used in this report is 40 acres, 35 of which are in olive production.

This study consists of General Assumptions for Establishing a Manzanillo Olive Orchard and Producing Manzanillo Olives and seven tables. It is intended as a guide only. It can be used to make production decisions, determine potential returns, prepare budgets, and evaluate production loans. 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 every situation. A blank, *Your Cost*, column is provided to enter your actual costs on Table 2, Sample Costs To Produce Manzanillo Olives and Table 3, Costs And Returns Per Acre to Produce Manzanillo Olives.

Tables included:

Table 1.	Costs Per Acre to Establish A Manzanillo Olive Orchard
Table 2.	Costs Per Acre to Produce Manzanillo Olives
Table 3.	Costs and Returns Per Acre to Produce Manzanillo Olives
Table 4.	Monthly Cash Costs Per Acre to Produce Manzanillo Olives
Table 5.	Whole Farm Annual Equipment, Investment and Business Overhead
Table 6.	Hourly Equipment Costs
Table 7.	Ranging Analysis

This and other studies can be obtained through the Department of Agricultural Economics, UC Davis (530 752-1515), or from selected county Cooperative Extension offices. For an explanation of calculations or assumptions used in this study refer to the attached General Assumptions or call the Department of Agricultural Economics, Cooperative Extension, University of California, Davis, California, (530) 752-3589 or the farm advisor in the county of interest.

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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

SAMPLE COSTS FOR ESTABLISHING A MANZANILLO OLIVE ORCHARD AND PRODUCING OLIVES Glenn and Tehama Counties - 1997

ASSUMPTIONS

The following are assumptions for sample costs of establishing a Manzanillo olive orchard and producing olives in Glenn and Tehama Counties. Practices described are not recommendations by the University of California, but represent production procedures and materials considered typical of a well managed orchard for Glenn and Tehama Counties. 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; 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 farm consists of 40 acres of land. Thirty five acres are planted to olives and five acres include roads, irrigation systems and farmstead. The orchard is farmed by the owner; additional management costs, ranging from \$60 to \$100 per acre, occur if practices are contracted. Property costs \$3,000 per acre. Because only 35 of the 40 acres is planted with olives, land is valued at \$3,429 per producing acre. Land is not depreciated.

Trees. While Sevillano is the olive cultivar that historically and currently makes up the majority of the acreage in Glenn and Tehama Counties, in this study, the orchard is established with Manzanillo to reflect the current trend. A few of the cultivars representing the remainder of the olive acreage in this area that might also be planted include Sevillano, Ascolano, or Mission. Establishment and production costs should not vary significantly between varieties with the exception of chemical thinning costs which are not applicable to Sevillano. The trees are planted at 22' X 22' spacing, 90 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 40 years.

Irrigation System. The irrigation system consists of a well, pump, and low pressure mainline with valves to flood the water into the orchard. It is completed before the trees are planted. For the first four years water is confined by ridges to a small area, 6-8 feet wide, underneath the trees. From the fifth year on water is delivered to the orchard by flooding down the middle of tree rows with the rows acting as borders for irrigation purposes. Since the orchard was planted on agricultural land it is assumed that a pump and well already exist and the cost of the irrigation system is for the recasing of the well, refurbishment of the pump and motor in addition to the installation of a new underground mainlines and field valves. The new irrigation system is installed after the orchard has been laid out and prior to planting. It is considered an improvement to the property; the cost is shown in the investments section of Table 4. The well, pump, and mainlines have an expected useful life of 40 years.

Water Cost. Pumped water (plus labor) is the irrigation cost. Water cost for irrigation is determined by the amount of pumped water using local electrical rates. The cost is based on using a 20 - 25 hp motor to pump 48 acre-inches 75 feet in a 100 foot well over 35 acres. Price per acre foot for water will vary from grower to grower in this region depending on the particular fuel cost, various well characteristics, and other irrigation factors. In this study, water is calculated to cost \$14.28 per acre foot. Irrigation rates increase each year as the orchard matures. No assumption is made about effective rainfall. The amount of water applied to the orchard during the establishment period varies each year and is shown in Table A.

Table A. Applied Irrigation Water

Year	Acre Feet/Year
1	0.5
2	1.0
3	1.5
4	2.0
5+	4.0

ESTABLISHMENT CULTURAL PRACTICES

Site Preparation. This orchard is established on ground that has been previously leveled for flood irrigated crops planted previously. The land is assumed to be well drained and either a class I or II soil. Land preparation begins with deep ripping the soil profile to 2 to 4 feet in order to break up any underlying hardpan which would affect root and water penetration and is followed by touch-up leveling. Leveling is important since the orchard utilizes a flood irrigation system. Ripping and leveling are performed by contract operators. The ground is disced and landplaned several times to break up large clods of soil and smooth the soil in advance of planting the trees. All operations that prepare the orchard for planting are done in the year prior to planting. However, for this study, these costs are included with those incurred in the first year as shown in Table 1.

Planting. Planting the orchard begins with marking tree sites with a small stake. Then holes are dug and trees planted. Later trunks are wrapped with white, water-resistant guards so trees are protected from sunburn and herbicides. A 6 foot, 2" X 2" stake is driven onto the ground next to the tree and the young tree is tied to it. Regular pruning, other than sucker removal, begins in the fourth year and hours required to perform this task, as well as costs, increase annually. Pruning is performed in spring months. In the second year, one tree per acre will have to be replanted.

Fertilization. Nitrogen is the major nutrient required for proper tree growth and optimum yields. Nitrogen fertilizer is applied in a granular form, urea (46% nitrogen), at increasing rates during orchard establishment. Urea is spread by hand through the first three years, then is applied by a mechanical spreader and tractor. Annual rates of N are shown in Table B.

Table B. Applied nitrogen for olives in Glenn and Tehama Counties

Year	Pounds of N/Tree	Pounds Of N/Acre	Pounds of Urea/Acre
1	0	0	0
2	0.2	18	39
3	0.5	45	98
4	0.7	63	137
5	1.1	99	215
6	1.3	117	254
7+	1.5	135	293

Orchard Floor Management. Control of weeds is important in young orchards so that trees are not stressed due competition for water and nutrients by weeds. Management of the orchard floor uses several techniques to control weeds; application of herbicides and mowing.

Chemical weed control in the orchard begins in spring of the first year with a foliar-applied herbicide applied as a spot spray four times along an eight foot strip in the tree rows. In the winter prior the second year a residual herbicide mix is sprayed down the tree row. From the second year on, the summer treatment consists of one spray down the tree row. The winter residual spray changes to a combination of herbicides and is sprayed along the tree row. By the third year the winter residual spray is a single herbicide application down the tree row.

During the first three years because no water is applied to the middles, it is only necessary to mow the row middles three times. From the fourth year when water is applied to the whole orchard floor, it is necessary to mow seven times.

Disease Management. During the developmental years, pest and disease controls are minimal. Peacock spot and olive knot are major diseases, causing defoliation and shoot death. These infect leaves and shoots. In this study, copper is used to prevent peacock spot and olive knot. It is applied annually beginning in the fall of the first year.

Insect Management. There are usually no insect problems that need control during the period of orchard establishment. Occasional control may be needed for black scale, but it usually can be controlled by pruning to open up canopies and increase heat mortality of the insect.

Establishment Cost. The cost to establish the orchard is used to determine non-cash overhead expenses, depreciation, and interest on investment for production years. The establishment cost is the sum of cash costs for land preparation, planting, trees, production expenses, and cash overhead for growing olive trees from planting until the end of the first year fruit is harvested. The *Accumulated Net Cash Cost/Acre* in the third year shown in Table 1, represents the establishment cost per acre. For this study, this cost is \$3,020 per acre or \$105,700 for the 35 acre orchard. Establishment cost is depreciated beginning in the fourth year over the remaining 37 of the 40 years that the orchard is assumed to be in production.

PRODUCTION CULTURAL PRACTICES

Pruning. Pruning strategy is critical to production. It is dependent on several factors such as olive cultivar and planting density. In this study, pruning is done in the spring by hand every other year. Since pruning is performed on a bi-annual basis half of the cost incurred in the pruning year is shown in Tables 2 and 3. Prunings are shredded in the row middles.

Fertilization. Mature tree nutrition is determined by leaf analysis in July. Nitrogen is sidedressed to the tree rows at a rate of 1.5 pound of N per tree annually. Fertilizer is in dry, granular form (urea = 46% nitrogen) and applied in January or February.

Orchard Floor Management. Weeds in the tree rows (an eight foot strip) are controlled with herbicides. In mature orchards residual herbicides are applied in the fall. Different herbicides are applied alternately each year to maintain effective weed control. Perennial weeds in the tree row receive one spot spray of a foliarly-applied herbicide each year. Vegetation in the row middles is mowed seven times during the growing season.

Insect Management. Black scale, an insect pest, requires occasional insecticide treatment. For trees that are pruned adequately and not allowed to become dense, chemical control is seldom necessary. Only following cool years or in those orchards that have become too dense would insecticide treatment be required to reduce the population to manageable levels. This study does not include any treatment for black scale.

Disease Management. The fungal disease, peacock spot and the bacterial disease, olive knot damage leaves, shoots, and branches. Their prevention requires an annual spray of copper following harvest and prior to Fall rains.

Thinning. Fruit thinning is needed once olives begin setting fruit in large quantities. Thinning improves fruit size, quality, uniformity, and promotes regular bearing each year. It is accomplished with the use of naphthaleneacetic acid (NAA). Application timing is critical to achieve the best results. Chemical thinning is usually performed 2 to 2 1/2 weeks after full bloom. NAA is applied in May or early June and begins in the fifth season.

Pesticide Recommendations. Inputs cited in this report are not recommendations. For specific pesticides choices and rates consult the UC IPM Olive Pest Management Guidelines. 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.

Harvest. Harvest starts in the third year after the orchard is planted. Olives are hand harvested and in this study, the crop is harvested by a contractor. All costs for contracted harvest operations are on a tonnage basis. A charge of \$225 per ton is used. Yield maturity is reached in the eighth year.

Assessments. Under a federal marketing order, mandatory assessment fees are collected by the California Olive Committee (COC). These assessments are charged to the processor to pay for olive marketing order administration, research, and market development. Growers do not pay the assessment.

Yields. As noted in the previous section, Manzanillo olives begin bearing an economic crop in the third year after planting. Typical annual yields for olives are measured in tons per acre and are shown in Table C. These yields are from the third year of orchard establishment to maturity.

Table C. Annual Yield Per Acre

Year	Tons Per Acre
3	0.25
4	1.00
5	1.50
6	2.00
7	3.00
8+	4.00

Returns. An estimated price of a \$600 per ton of Manzanillo olives is used in this study so that a ranging analysis for different yields and price can be calculated. Returns, shown in Table 6, will vary and the yields and prices used in this study are an estimate taking into consideration current conditions.

Risk. The risks associated with producing and marketing olives should not be minimized. 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 production.

Risk is caused by various sources of uncertainty which include production, price, and financial. Examples of these are insect damage, a decrease in price, or an increase in interest rates. Due to the risk involved, access to a market is crucial. A market channel should be determined before olive orchards are planted and brought into production.

Labor. Hourly wages for workers are \$7.15, and \$5.15 per hour for skilled, and field workers respectively. Adding 34% for Workers Compensation, Social Security, Medicare insurance, and other possible benefits gives the labor rates shown of \$9.58 per hour for skilled labor, and \$6.90 per hour for field labor. Labor for operations involving machinery are 20% higher than the operation time given in Table 1 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and repair.

Wages for management are not included as a cash overhead cost. The orchard is farmed by the owner; additional management costs ranging from \$60 to \$100 per acre, occur if practices are contracted. Any return above total costs is considered a return to management and risk.

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, sanitation 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. Salvage value for investments will vary.

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 10.00% per year. A nominal interest rate is the going market cost of borrowed funds.

Office Expense. Office and business expenses are estimated at \$106 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc. Cash overhead costs are found in Tables 1-4.

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 0.713% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$469 for the entire farm.

Sanitation Services Sanitation services provide portable toilets for the orchard and cost the farm \$122 annually. This cost includes delivery and servicing of toilets. Cash overhead costs are included in Tables 1-5.

Non-Cash Overhead. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Although farm equipment on olives orchards in the Southern San Joaquin Valley 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 (Equipment and Investments) are shown in Tables 1-3, and 5. They represent the capital recovery cost for investments on an annual per acre basis.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It 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 downpayment 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. The calculation for the annual capital recovery costs is taken from the publication *Farm Management* (Boehlje and Eidman) and is as follows.

$$\frac{\text{Purchase Price} - \text{Salvage Value}}{\text{Capital Recovery Factor}} + \frac{\text{Salvage Value} \times \text{Interest Rate}}$$

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its 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 life in years is estimated by dividing the wear-out life, as given by the ASAE by the annual use in hours. Salvage value is calculated as:

$$\text{New Price} \times \% \text{Remaining Value}$$

Salvage value for other investments including irrigation systems, buildings, and miscellaneous equipment is zero. The salvage value for land is equal to the purchase price because land does not depreciate from use. 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. It is the function of the interest rate and years of life of the equipment.

Interest Rate. The interest rate of 8.25% used to calculate capital recovery cost is the USDA-ERS's ten year average of California's agricultural sector longrun 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.

Equipment Cash 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 equipment costs on a per acre basis, the following hourly charges are calculated first and shown in Table 6. 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 Table 2 is determined by multiplying the total hourly operating cost in Table 6 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 (Operation Time) for a given operation to account for fueling, moving equipment, and setup time. Prices for on-farm delivery of diesel and gasoline are \$0.97 and \$1.30 per gallon, respectively.

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

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University of California. 1994. Olive Production Manual. Pub. 3353. University of California, Division of Agriculture and Natural Resources. Oakland, CA.

For information concerning the above mentioned University of California publications contact UC DANR Communications Services (1-800-994-8849) or your local county Cooperative Extension office.

Table 1.

SAMPLE COSTS PER ACRE TO ESTABLISH A MANZANILLO OLIVE ORCHARD
GLENN & TEHAMA COUNTIES - 1997

Year	Cost Per Acre		
	1st	2nd	3rd
Tons Per Acre			0.25
Planting Costs:			
Land Preparation - Subsoil	\$150		
Land Preparation - Laser Leveling	100		
Land Preparation - Disc 3X & Touch-up Leveling	15		
Trees: 90 Per Acre @ \$4.29 ea., (1% in 2nd year)	386	\$4	
Survey, Mark, Dig Holes & Plant	158	2	
Wrap, Stake & Tie Trees	122	17	
TOTAL PLANTING COSTS	931	23	
Cultural Costs:			
Pruning And Suckering	14	28	\$28
Brush Disposal		9	11
Fertilizer - Nitrogen		17	19
Weed Control - Mow Centers (3X First 3 Years) 7X	18	18	18
Weed Control - Winter Residual		60	9
Weed Control - In-Season Tree Rows (4X First Year)	41	9	9
Irrigate	23	31	40
Thinning			
Disease Control - Fall Fungicide	9	12	17
Pickup Truck Use	135	135	135
ATV Use	104	104	104
Leaf Analysis	1	1	1
TOTAL CULTURAL COSTS	345	424	391
Harvest Costs:			
Hand Pick			56
TOTAL HARVEST COSTS			56
Interest On Operating Capital @ 10.00%	120	27	16
TOTAL OPERATING COSTS/ACRE	1,396	474	463
Cash Overhead Costs:			
Office Expense	121	121	121
Sanitation Fees	3	3	3
Liability Insurance	13	13	13
Property Taxes	55	55	55
Property Insurance	39	39	39
Investment Repairs	48	48	48
TOTAL CASH OVERHEAD COSTS	279	279	279
TOTAL CASH COSTS/ACRE	1,675	753	742
INCOME/ACRE FROM PRODUCTION			150
NET CASH COSTS/ACRE FOR THE YEAR	1,675	753	592
ACCUMULATED NET CASH COSTS/ACRE	1,675	2,428	3,020

Table 1. continued.

Year	Cost Per Acre		
	1st	2nd	3rd
Tons Per Acre			0.25
Non-Cash Overhead Costs (Capital Recovery):			
Shop Building	124	124	124
Irrigation System	44	44	44
Shop Tools	41	41	41
Ladders - 10 total			
Land @ \$3,429 Acre	283	283	283
Pruning Tools	15	15	15
Equipment	203	217	220
TOTAL NON-CASH OVERHEAD	710	724	727
TOTAL COST/ACRE FOR THE YEAR	2,385	1,477	1,469
INCOME/ACRE FROM PRODUCTION			150
TOTAL NET COST/ACRE FOR THE YEAR	2,385	1,477	1,319
TOTAL ACCUMULATED NET COST/ACRE	2,385	3,862	5,181

Table 2.

COSTS PER ACRE TO PRODUCE MANZANILLO OLIVES
GLENN & TEHAMA COUNTIES - 1997

Labor Rate: \$9.58/hr. machine labor
\$6.90/hr. non-machine labor

Interest Rate: 10.00%
Yield per Acre: 4.0 Ton

Operation	Cash and Labor Costs per Acre						Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent	Total Cost	
Cultural:							
Fertilizer - Nitrogen	0.18	2	1	48	4	55	
Irrigate	2.00	14	0	70	0	83	
Mow Centers - 7X	2.09	24	14	0	0	38	
Pruning & Sucker	15.00	103	0	0	0	103	
Brush Disposal	0.37	11	2	0	0	13	
Weed Control - Spot Spray	0.33	4	2	5	0	11	
Thinning Spray	0.25	3	2	96	0	101	
Weed Control - Winter Strip Spray	0.25	3	1	7	0	11	
Disease Control - Fall Fungicide Spray	0.25	3	2	24	0	29	
Pickup Truck Use	4.08	47	24	0	0	71	
ATV Use	4.08	47	5	0	0	52	
Leaf Analysis	0.00	0	0	0	1	1	
TOTAL CULTURAL COSTS	28.89	261	53	249	5	568	
Harvest:							
Pick Fruit	0.00	0	0	0	900	900	
TOTAL HARVEST COSTS	0.00	0	0	0	900	900	
Interest on operating capital @ 10.00%							31
TOTAL OPERATING COSTS/ACRE		261	53	249	905	1499	
CASH OVERHEAD:							
Office Expense							121
Liability Insurance							13
Sanitation Fees							3
Property Taxes							70
Property Insurance							50
Investment Repairs							48
TOTAL CASH OVERHEAD COSTS							305
TOTAL CASH COSTS/ACRE							1804

Table 2. Continued

NON-CASH OVERHEAD:

Investment	Per producing Acre	-- Annual Cost -- Capital Recovery	
Buildings	1191	124	124
Shop Tools	354	41	41
Olive Orchard Establishment	3020	252	252
Hand Tools	129	15	15
Ladders - 10 total	39	6	6
Land	3429	283	283
Flood Irrigation System	514	44	44
Equipment	1442	190	190
TOTAL NON-CASH OVERHEAD COSTS	10118	954	954
TOTAL COSTS/ACRE			2758

Table 3.

COSTS AND RETURNS PER ACRE TO PRODUCE OLIVES
GLENN & TEHAMA COUNTIES - 1997

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Olives	4.00	Ton	600.00	2400	

TOTAL GROSS RETURNS FOR OLIVES				2400	
OPERATING COSTS					
Fertilizer:					
46-0-0	135.00	Lb N	0.356	48	
Rent:					
Spreader Rental	1.00	Acre	4.00	4	
Irrigation:					
Water	48.00	AcIn	1.45	70	
Herbicide:					
Roundup Ultra	0.72	Pint	6.88	5	
Princep Caliber 90	1.20	Lb	5.45	7	
Thinning Agent:					
Fruit Fix 200	96.00	Oz	1.00	96	
Custom:					
Harvest Olives	4.00	Ton	225.00	900	
Leaf Analysis	1.00	Acre	1.00	1	
Fungicide:					
Kocide	8.00	Lb	2.99	24	
Labor (machine)	14.27	Hrs	9.58	137	
Labor (non-machine)	18.00	Hrs	6.90	124	
Fuel - Gas	14.99	Gal	1.30	19	
Fuel - Diesel	11.06	Gal	0.97	11	
Lube				5	
Machinery repair				18	
Interest on operating capital @ 10.00%				31	

TOTAL OPERATING COSTS/ACRE				1499	
NET RETURNS ABOVE OPERATING COSTS				901	
CASH OVERHEAD COSTS:					
Office Expense				121	
Liability Insurance				13	
Sanitation Fees				3	
Property Taxes				70	
Property Insurance				50	
Investment Repairs				48	

TOTAL CASH OVERHEAD COSTS/ACRE				305	
TOTAL CASH COSTS/ACRE				1804	

Table 3. Continued

NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):	
Buildings	124
Shop Tools	41
Olive Orchard Establishment	252
Hand Tools	15
Ladders - 10 total	6
Land	283
Flood Irrigation System	44
Equipment	190

TOTAL NON-CASH OVERHEAD COSTS/ACRE	954
TOTAL COSTS/ACRE	2758
NET RETURNS ABOVE TOTAL COSTS	-358

Table 4.

U.C. COOPERATIVE EXTENSION
 MONTHLY CASH COSTS PER ACRE TO PRODUCE MANZANILLO OLIVES
 GLENN & TEHAMA COUNTIES - 1997

Beginning JAN 97	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 97	97	97	97	97	97	97	97	97	97	97	97	97	

Cultural:													
Fertilizer - Nitrogen		55											55
Irrigate				8	11	14	14	14	14	11			83
Mow Centers - 7X				6	6	6	6	6	6				38
Pruning & Sucker					103								103
Brush Disposal					13								13
Weed Control - Spot Spray					11								11
Thinning Spray					101								101
Weed Control - Winter Strip										11			11
Disease Control - Fall Fungicide											29		29
Pickup Truck Use	6	6	6	6	6	6	6	6	6	6	6	6	71
ATV Use	4	4	4	4	4	4	4	4	4	4	4	4	52
Leaf Analysis					1								1
TOTAL CULTURAL COSTS	10	65	10	24	256	30	30	30	30	32	39	10	568

Harvest:													
Pick Fruit										900			900
TOTAL HARVEST COSTS										900			900

Interest on oper. capital	0	1	1	1	3	3	4	4	4	12	-0	-0	31
TOTAL OPERATING COSTS/ACRE	10	66	11	25	259	33	34	34	34	944	39	10	1499

OVERHEAD:													
Office Expense	10	10	10	10	10	10	10	10	10	10	10	10	121
Liability Insurance	13												13
Sanitation Fees	0	0	0	0	0	0	0	0	0	0	0	0	3
Property Taxes	35						35						70
Property Insurance	25						25						50
Investment Repairs	4	4	4	4	4	4	4	4	4	4	4	4	48
TOTAL CASH OVERHEAD COSTS	87	14	14	14	14	14	74	14	14	14	14	14	305

TOTAL CASH COSTS/ACRE	98	80	25	40	274	48	108	48	49	958	53	24	1804
=====													

Table 5.

WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
GLENN & TEHAMA COUNTIES - 1997

ANNUAL EQUIPMENT COSTS

=====								
- Cash Overhead -								
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur- ance	Taxes	Total

97	55 HP 2WD Tractor	32270	12	8068	3919	144	202	4264
97	ATV 4WD	4219	7	1600	639	21	29	689
97	Brush Rake - 10'	1584	25	45	151	6	8	165
97	Front End Loader	4852	15	466	559	19	27	604
97	Mower - Flail 10'	8380	10	1482	1162	35	49	1246
97	Orchard Sprayer - 500 Gal	19741	10	3491	2737	83	116	2936
97	Pickup Truck - 1/2 Ton	18200	7	6904	2758	90	126	2973
97	Weed Sprayer - 100 Gal	3947	10	698	547	17	23	587

TOTAL		93193		22754	12472	413	580	13465
=====								
60% of New Cost *		55916		13652	7483	248	348	8079

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

ANNUAL INVESTMENT COSTS

=====								
----- Cash Overhead -----								
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur- ance	Taxes	Repairs	Total

INVESTMENT								
Buildings	41672	20		4324	149	208	833	5514
Flood Irrigation System	18000	40		1550	64	90	540	2244
Hand Tools	4505	15	451	518	18	25	50	611
Ladders - 10 total	1371	10	137	197	5	8	0	210
Land	120000	50	120000	9900	856	1200	0	11956
Olive Orchard Establishment	105700	37		8816	377	529	0	9722
Shop Tools	12389	15	1239	1425	49	68	247	1789

TOTAL INVESTMENT	303637		121827	26730	1517	2127	1670	32044
=====								

Table 5. Continued

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	40.00	Acre	11.73	469
Office Expense	40.00	Acre	106.00	4240
Sanitation Fees	40.00	Acre	3.04	122

Table 6.

HOURLY EQUIPMENT COSTS

Yr Description	Actual Hours Used	COSTS PER HOUR						Total Oper.	Total Costs/Hr.
		Capital Recovery	- Cash Overhead - Insur- ance	Taxes	Repairs	Operating Fuel & Lube			
97 55 HP 2WD Tractor	143.3	16.41	0.60	0.84	1.37	3.01	4.38	22.24	
97 ATV 4WD	143.0	2.68	0.09	0.12	0.31	1.00	1.31	4.20	
97 Brush Rake - 10'	13.0	7.00	0.27	0.38	0.20	0.00	0.20	7.85	
97 Front End Loader	13.0	25.89	0.88	1.23	0.67	0.00	0.67	28.67	
97 Mower - Flail 10'	73.2	9.52	0.29	0.40	1.78	0.00	1.78	11.99	
97 Orchard Sprayer - 500 Gal	17.5	93.84	2.84	3.98	2.40	0.00	2.40	103.07	
97 Pickup Truck - 1/2 Ton	285.0	5.81	0.19	0.26	1.32	4.48	5.80	12.06	
97 Weed Sprayer - 100 Gal	20.4	16.08	0.49	0.68	1.04	0.00	1.04	18.29	

Table 7.

RANGING ANALYSIS
GLENN & TEHAMA COUNTIES - 1997

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE OLIVES

	YIELD (TON/ACRE)						
	2	3	4	5	6	7	8
OPERATING COSTS/ACRE:							
Cultural Cost	568	568	568	568	568	568	568
Harvest Cost	450	675	900	1125	1350	1575	1800
Interest on operating capital	28	30	31	33	35	37	39
TOTAL OPERATING COSTS/ACRE	1045	1272	1499	1726	1953	2180	2407
TOTAL OPERATING COSTS/TON	523	424	375	345	325	311	301
CASH OVERHEAD COSTS/ACRE	305	305	305	305	305	305	305
TOTAL CASH COSTS/ACRE	1351	1577	1804	2031	2258	2485	2712
TOTAL CASH COSTS/TON	675	526	451	406	376	355	339
NON-CASH OVERHEAD COSTS/ACRE	954	954	954	954	954	954	954
TOTAL COSTS/ACRE	2305	2531	2758	2985	3212	3439	3666
TOTAL COSTS/TON	1152	844	690	597	535	491	458

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR OLIVES

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
	2	3	4	5	6	7	8
Olives							
350.00	-345	-222	-99	24	147	270	393
400.00	-245	-72	101	274	447	620	793
450.00	-145	78	301	524	747	970	1193
500.00	-45	228	501	774	1047	1320	1593
550.00	55	378	701	1024	1347	1670	1993
600.00	155	528	901	1274	1647	2020	2393
650.00	255	678	1101	1524	1947	2370	2793

Table 7. Continued

NET RETURNS PER ACRE ABOVE CASH COSTS FOR OLIVES

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Olives	2	3	4	5	6	7	8
350.00	-651	-527	-404	-281	-158	-35	88
400.00	-551	-377	-204	-31	142	315	488
450.00	-451	-227	-4	219	442	665	888
500.00	-351	-77	196	469	742	1015	1288
550.00	-251	73	396	719	1042	1365	1688
600.00	-151	223	596	969	1342	1715	2088
650.00	-51	373	796	1219	1642	2065	2488

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR OLIVES

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Olives	2	3	4	5	6	7	8
350.00	-1605	-1481	-1358	-1235	-1112	-989	-866
400.00	-1505	-1331	-1158	-985	-812	-639	-466
450.00	-1405	-1181	-958	-735	-512	-289	-66
500.00	-1305	-1031	-758	-485	-212	61	334
550.00	-1205	-881	-558	-235	88	411	734
600.00	-1105	-731	-358	15	388	761	1134
650.00	-1005	-581	-158	265	688	1111	1534

Table 8.

COSTS AND RETURNS / BREAKEVEN ANALYSIS
GLENN & TEHAMA COUNTIES - 1997

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	2400	1499	901	1804	596	2758	-358

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	84000	52474	31526	63150	20850	96540	-12540

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	----- Breakeven Price To Cover -----		
			Operating Costs	Cash Costs	Total Costs
Olives	4.0	Ton	374.81	451.07	689.57

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price (\$/Unit)	----- Breakeven Yield To Cover -----		
			Operating Costs	Cash Costs	Total Costs
Olives	Ton	600.00	2.5	3.0	4.6