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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2005

SAMPLE COSTS TO ESTABLISH AND PRODUCE

# *TABLE OLIVES*

Manzanillo Variety



**SAN JOAQUIN VALLEY –  
MICRO-SPRINKLER IRRIGATION**

Prepared by:

Neil V. O'Connell  
Louise Ferguson

UC Cooperative Extension Farm Advisor, Tulare County  
UC Cooperative Extension Pomologist, Kearney Agriculture and Extension  
Center

Mark W. Freeman  
Karen Klonsky

UC Cooperative Extension Farm Advisor, Fresno County  
UC Cooperative Extension Specialist, Department of Agricultural and  
Resource Economics, UC Davis

Pete Livingston

UC Cooperative Extension Staff Research Associate, Department of  
Agricultural and Resource Economics, UC Davis

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# STUDY CONTENTS

INTRODUCTION .....	2
ASSUMPTIONS .....	3
Orchard Establishment Cultural Practices and Material Inputs .....	3
Production Cultural Practices and Material Inputs .....	4
Cash Overhead Costs .....	7
Non-Cash Overhead Costs.....	8
REFERENCES .....	10
Table 1.    SAMPLE COSTS PER ACRE TO ESTABLISH AN OLIVE ORCHARD.....	11
Table 2.    COSTS PER ACRE TO PRODUCE TABLE OLIVES .....	13
Table 3.    COSTS AND RETURNS PER ACRE TO PRODUCE TABLE OLIVES .....	14
Table 4.    MONTHLY CASH COSTS TO PRODUCE TABLE OLIVES.....	15
Table 5.    WHOLE FARM EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS .....	16
Table 6.    HOURLY EQUIPMENT COSTS.....	17
Table 7.    RANGING ANALYSIS .....	18
Table 8.    COSTS AND RETURNS/BREAKEVEN ANALYSIS .....	19
Table 9.    DETAILS BY OPERATION .....	20

## INTRODUCTION

Sample costs to establish an olive orchard and produce Manzanillo table olives in the San Joaquin Valley are presented in this study. 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 production practices considered typical for the crop and area, but will not apply to every situation. Sample costs for labor, materials, equipment, and custom services are based on current figures. A blank column, “*Your Costs*”, in Tables 1 and 2 is provided for your convenience.

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, 530-752-2414 or your local UC Cooperative Extension office.

Sample Cost of Production Studies for many commodities can be downloaded at <http://coststudies.ucdavis.edu>, requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-4424 or obtained from the local county UC Cooperative Extension offices. Some archived studies are also available on the website.

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## ASSUMPTIONS

The assumptions refer to Tables 1 to 9 and pertain to sample costs to establish an olive orchard and produce Manzanillo table olives in the San Joaquin Valley. Practices described represent production practices and materials considered typical of a well-managed orchard in the region. Costs, materials, and practices in this study will not apply to all situations. Establishment and cultural practices vary among growers within the region. **The use of trade names and cultural practices 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 or cultural practices.**

**Farm.** The farm consists of 40 contiguous acres. Thirty-five acres are planted to olives and five acres include roads, irrigation systems and farmstead. The owner farms the orchard.

**Trees.** The olive cultivar is Manzanillo. 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. The trees are planted at 12' by 24' spacing, 151 trees per acre. In the seventh or eighth year half of the trees are removed so the orchard density is 75 trees per acre. Typically, trees are removed, pushed out of the orchard, and chipped. However, mature olive trees can be sold to a limited landscape market. 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.

### ORCHARD ESTABLISHMENT CULTURAL PRACTICES AND MATERIAL INPUTS

**Site Preparation.** The orchard is established on ground previously leveled for flood irrigated crops. The land is assumed to be either a class II or III soil. Land preparation begins with deep ripping from 2 to 4 feet deep to break up any underlying hardpan that would affect root penetration and water infiltration. The ground is disced three times and landplaned to smooth the surface. Custom operators do all operations that prepare the orchard for planting 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 hand dug and the trees planted. In a single pass, the trunks are wrapped with tree guards for sunburn and herbicide protection, a 6-foot by 2-inch by 2-inch stake is driven into the ground next to the tree and the young tree is tied to the stake. The cost includes the labor, tree guards, stake and tying twine. In the second year, one tree per acre will be replanted.

**Training/Pruning.** Training, which includes some pruning and suckering, begins the first year. Regular pruning begins in the spring (April) of the fourth year. Pruning in this study is done by grower labor, although it is a common practice to hire contract labor.

**Irrigation.** Water cost for irrigation is a blend of district and pumped water. Price per acre foot for water will vary from grower to grower in this region depending on the particular irrigation district, and/or various well characteristics, and other irrigation factors. In this study, water is calculated to cost \$50 per acre-foot or \$4.17 per acre-inch. Irrigation amounts increase each year as the orchard matures. It is assumed that one acre-foot of water is available from rainfall.

The amount of water applied to the orchard during its life varies and is shown for the establishment and production years on Table A.

**Table A. Applied irrigation water**

Year	Acre-feet/year
1	0.3
2	0.7
3	1.5
4	2.5
5+	3.1

Water is delivered to the orchard by micro-sprinklers in the tree row. The irrigation system is installed and completed before the trees are planted. It is considered an improvement to the property and cost is shown in the investments section of Table 5. The pump, filter station, mainlines, laterals, and risers have an expected useful life of 40 years. The life of the micro-sprinkler system is estimated at 10 years.

**Fertilization.** Nitrogen is the major nutrient required for proper tree growth and optimum yields. Nitrogen fertilizer is applied at increasing rates during orchard establishment. UN-32 fertilizer (32% nitrogen) is applied through the micro-sprinkler system in increasing rates through orchard establishment. The fertilizer is applied in March of the first year and in equally split amounts in March and June during the subsequent years.

Year	lbs N/tree	lbs N/acre
1	0.06	6
2	0.20	11
3	0.50	23
4	0.70	23
5+	1.00	45

**Orchard Floor Management.** Chemical weed control in the orchard begins in spring of the first year with a post emergent herbicide applied as a spot spray in the middles. Control of weeds is important in young orchards so that trees are not stressed due to competition for water and nutrients. Spot sprays are used in the middles a total four times in the first year and two times in subsequent years. In the fall of the first and second years a residual herbicide mix is sprayed down the tree rows. The spot sprays are adequate for weed control in the middles due to the low amount of irrigation water applied to the very young trees and the low volume sprinklers. Beginning in the third year a combination of residual herbicides is sprayed down the tree rows and middles in the fall. The application rates increase as the trees mature.

**Disease Management.** During the developmental years, pest and disease controls are minimal. Peacock spot and olive knot are major diseases that infect leaves and shoots, causing defoliation and shoot death. A single spray of copper is used to prevent peacock spot and olive knot in this study. It is applied in the fall in all years.

**Insect Management.** Except for the olive fruit fly, there are usually no insect problems that need control during orchard establishment. Beginning in the third year, eight pesticide treatments are made during the growing season from July through harvest in October for olive fly. The olive fruit fly is a relatively new pest to California that has caused economic damage in its historic range. Because most olives grown in California are destined for table fruit, processors will not tolerate olive fruit fly injury; therefore, treatments for the fly are made in this study. It is hoped that ongoing research will lead to controls applied only when needed, thereby reducing applications and costs.

Occasional chemical control may be needed for black scale, but usually it can be controlled by pruning to open up canopies and increase mortality of the insect due to heat.

## PRODUCTION CULTURAL PRACTICES AND MATERIAL INPUTS

**Pruning.** Pruning is critical to production and is dependent on several factors such as olive cultivar and planting density. In this study olive trees are planted at 151 trees per acre, but in its early maturity the orchard is reduced in density to 75 trees per acre. Removing trees from the orchard to allow for full canopy development is required, but is spread out over the years by selective pruning prior to tree removal. The cost for tree removal is not shown in this study. Pruning is done in the spring by hand and then are stacked in the row middles and shredded.

**Thinning.** Chemical fruit thinning is usually done two to two and one-half weeks after full bloom. Naphthalene acetic acid is applied in May or early June beginning in the fifth season. Thinning is generally not needed every year, therefore this study includes a treatment once every two years with one-half of the cost allocated to the crop each year. Fruit thinning is needed once olives begin setting fruit in large quantities. Thinning improves fruit size, quality, uniformity, and promotes regular bearing each year. Application timing is critical to achieve the best results.

**Irrigation.** Water costs of \$2.16 per acre-inch and a pumping cost of at \$2.01 per acre-inch for pressurizing the micro-sprinkler irrigation system accounts for the water cost of \$4.17 per acre-inch or \$50 per acre-foot. Price per acre-foot for water will vary from grower to grower in this region depending on the irrigation district and pumping costs. Labor is not included in the \$50 per acre-foot cost of water, but is incorporated in the cost of each irrigation.

**Fertilization.** Mature tree nutrition is determined by leaf analysis in July. Nitrogen is applied at a rate of one pound of N per tree annually. Nitrogen as UN-32 is applied through the micro-sprinkler system in January.

**Pest Management.** The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Olives*. For more information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu). For information and pesticide use permits, contact the local county agricultural commissioner's office. Many pesticides require or suggest the use of various adjuvants, but these costs are not included in the study.

*Pest Control Adviser (PCA).* Written recommendations are required for many pesticides and are made by licensed Pest Control Advisors (PCA). In addition the PCA will monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCA's or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. A PCA cost of \$25.00 per acre is allocated in this study.

*Weeds/Orchard Floor Management.* Weeds in the tree rows and middles are controlled with herbicides. Annual weeds are controlled with residual herbicide applied in the fall. Perennial weeds receive two spot sprays using a postemergence herbicide during the growing season.

*Insects.* Treatment for the olive fruit fly in a mature orchard is the same as for a young, fruit-bearing orchard. Beginning in June through harvest in September, eight pesticide applications are made for control of the olive fruit fly.

Black scale, an insect pest, requires an occasional chemical treatment. In orchards where the trees are pruned adequately and do not become too dense, chemical control is seldom necessary. Only in years following a cool spring and summer or in orchards that are too dense would insecticide treatment be required to reduce the population to manageable levels. This study assumes that black scale is a problem and is treated every third year.

*Disease.* The fungal diseases 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.

**Harvest.** Harvest starts in the third year after the orchard is planted. Olives are hand harvested and in this study, a contractor harvests the crop. All costs for contracted harvest operations are on a tonnage basis. A charge of \$300 per ton is used. A commercial yield begins in the third year and maturity is normally reached by the eighth year.

**Yields.** As noted in the previous section, Manzanillo olives begin bearing an economic crop in the third year and full production (yield maturity) is reached in the seventh year. Full production is estimated to be the average annual yield over the remaining orchard life. Typical annual yields for olives in the San Joaquin Valley are measured in tons per acre and are shown in Table C.

Year	Tons per acre
3	1.0
4	2.0
5	3.5
6	4.0
7+	5.0

**Returns.** An estimated price of \$450 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 estimated, based on current markets.

**Assessments.** The California Olive Committee (COC) under a federal marketing order collects a mandatory assessment fee. These assessments are charged to the processor to pay for olive marketing order administration, research, and market development. Growers do not directly pay the assessment.

**Pickup/ATV.** The grower uses the pickup for business and personal use. It is assumed that 2,000 miles are for business use. The All Terrain Vehicle (ATV) is used for inspecting and monitoring the orchard. It is also used for irrigating and checking the system, but is not included in the irrigation cost. It is assumed that the ATV travels 2,000 miles per year.

**Labor.** Labor rates of \$16.59 per hour for machine operators and \$13.99 for general labor includes payroll overhead of 43%. The basic hourly wages are \$11.60 for machine operators and \$9.78 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance (code 0016), and a percentage for other possible benefits. Workers' compensation insurance costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2005 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 2 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

**Management.** Wages for management are not included as a cash overhead cost. The owner farms the orchard and the returns above total costs are considered a return to management. Additional management costs ranging from \$75 to \$125 per acre may occur if practices are contracted.

**Equipment Operating Costs.** 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 horsepower and fuel type. Prices for on-farm delivery of diesel and gasoline are \$1.51 and \$2.05 per gallon, respectively. The fuel prices are a January 2004 average based on four California delivery locations plus \$0.24 per gallon, which is one-half the high – low price range for regular gasoline in 2003 from the California State Automobile Association Monthly Survey. The cost includes a 2.25% sales tax (effective September 2001) on diesel fuel and 7.25% sales tax on gasoline. Gasoline also includes federal and state excise tax, which can be refunded for on-farm use when filing your income tax. The

fuel, lube, and repair cost per acre for each operation in the “Cost Per Acre to Produce” table is determined by multiplying the total hourly operating cost in the “Hourly Equipment Costs” table for each piece of equipment used from the Operation Time (hours/acre) column by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

**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 7.65% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge.

**Risk.** The risks associated with producing and marketing table 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 that affect the profitability and economic viability of table olive production. A market channel should be determined before table olives are planted and brought into production. Though not used in this study, crop insurance is a risk management tool available to growers through the Farm Service Agency (FSA) office.

## CASH OVERHEAD COSTS

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, equipment repairs, and management.

*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.

*Insurance.* Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.690% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$529 for the entire farm or \$15 per producing acre.

*Office Expense.* Office and business expenses are estimated at \$149 per producing acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges.

*Sanitation Services.* Sanitation services provide portable toilets for the orchard and cost the farm \$235 annually. This cost includes delivery and servicing of toilets.

*Investment Repairs.* Annual maintenance on buildings and irrigation equipment is calculated as 2% of the purchase price.

## NON-CASH OVERHEAD COSTS

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

*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). 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 formula for the calculation of the annual capital recovery costs is:

$$\left[ \left( \begin{array}{cc} \text{Purchase} & - & \text{Salvage} \\ \text{Price} & & \text{Value} \end{array} \right) \times \left( \begin{array}{c} \text{Capital} \\ \text{Recovery} \\ \text{Factor} \end{array} \right) \right] + \left[ \begin{array}{cc} \text{Salvage} & \times & \text{Interest} \\ \text{Value} & & \text{Rate} \end{array} \right]$$

*Salvage Value.* Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (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 wear out 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 the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in the tables.

*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 used and the life of the machine.

*Interest Rate.* The interest rate of 6.01% 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.

*Building.* The shop building is a 1,800 square foot metal building or buildings on a cement slab.

*Land.* Land cost \$5,000 per acre. Because only 35 of the 40 acres are planted with olives, the land is valued at \$5,714 per producing acre.

*Field/Shop.* This orchard includes a shop, shop tools, and field tools.

*Fuel Tanks.* A single 100-gallon fuel tank using gravity feed is on a metal stands. The tank is setup in a cement containment pad that meets federal, state, and county regulations.

*Irrigation System.* The micro-sprinkler irrigation system is laid out and installed prior to planting and the labor cost is included in the system cost. The irrigation system consists of a pump, filtration and pressure system connected to a micro-sprinkler system.



*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 \$3,613 per acre or \$126,445 for the 35-acre orchard. Establishment cost is depreciated beginning in the fourth year over the remaining 57 of the 60 years that the orchard is assumed to be in production.

*Equipment.* Farm equipment is purchased new or used, but the 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. 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 repairs, fuel, and lubrication and are discussed under operating costs.

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

**Acknowledgment.** Assistance provided by local producers and supplier was greatly appreciated.

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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.

UC COOPERATIVE EXTENSION  
 SAMPLE COSTS PER ACRE TO ESTABLISH AN OLIVE ORCHARD  
 SAN JOAQUIN VALLEY – 2005

Labor Rate: \$16.59/hr. machine labor  
 \$13.99/hr. non-machine labor

Interest Rate: 7.65%  
 Yield per Acre: 5.0 Tons

Year	Cost Per Acre					
	1st	2nd	3rd	4th	5th	6th
Tons Per Acre			1.0	2.0	3.5	4.0
<b>Planting Costs:</b>						
Land Preparation - Subsoil: contract	\$185					
Land Preparation - Disc 3X: contract	72					
Land Preparation - Float	3					
Survey, Mark, Dig, & Plant Orchard	282	\$2				
Trees: 151 Per Acre (4% Replant In 2nd Year)	763	\$5				
Wrap, Stake, & Tie Trees	<u>226</u>	<u>34</u>				
<b>TOTAL PLANTING COSTS</b>	<b>1,531</b>	<b>41</b>				
<b>Cultural Costs:</b>						
Prune, Train, & Sucker	14	21	\$21	\$189	\$280	\$378
Brush Disposal		9	15	15	15	15
Weed Control - Spot Spray 4X: year 1, 2X: Year 2+	52	26	26	26	26	26
Fertilize - Nitrogen	2	4	9	9	17	17
Irrigate	43	78	107	153	183	183
Leaf Analysis	25	25	25	25	25	25
Insect Control - Olive Fruit Fly 8X			73	73	73	73
Pickup Truck Use	51	51	51	51	51	51
ATV Truck Use	<u>43</u>	<u>43</u>	<u>43</u>	<u>43</u>	<u>43</u>	<u>43</u>
<b>TOTAL CULTURAL COSTS</b>	<b>230</b>	<b>257</b>	<b>370</b>	<b>584</b>	<b>713</b>	<b>811</b>
<b>Harvest Costs:</b>						
Pick Fruit			<u>300</u>	<u>600</u>	<u>1,050</u>	<u>1,200</u>
<b>TOTAL HARVEST COSTS</b>			<b>300</b>	<b>600</b>	<b>1,050</b>	<b>1,200</b>
<b>Postharvest Costs:</b>						
Disease Control - Fall Fungicide	35	39	39	41	43	43
Weed Control – Fall Residual Spray	<u>37</u>	<u>27</u>	<u>19</u>	<u>19</u>	<u>19</u>	<u>22</u>
<b>TOTAL POSTHARVEST COSTS</b>	<b>72</b>	<b>66</b>	<b>58</b>	<b>60</b>	<b>62</b>	<b>65</b>
Interest On Operating Capital @ 7.65%	140	17	11	23	31	37
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>1,973</b>	<b>381</b>	<b>739</b>	<b>1,267</b>	<b>1,856</b>	<b>2,113</b>
<b>Cash Overhead Costs:</b>						
Office Expense	149	149	149	149	149	149
Sanitation Fees	13	13	13	13	13	13
Liability Insurance	13	13	13	13	13	13
Property Taxes	77	78	96	96	96	96
Property Insurance	53	54	66	66	66	66
Investment Repairs	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>	<u>7</u>
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>312</b>	<b>314</b>	<b>344</b>	<b>344</b>	<b>344</b>	<b>344</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>2,285</b>	<b>695</b>	<b>1,084</b>	<b>1,611</b>	<b>2,200</b>	<b>2,457</b>
<b>INCOME/ACRE FROM PRODUCTION</b>			<b>450</b>	<b>900</b>	<b>1,575</b>	<b>1,800</b>
<b>NET CASH COSTS/ACRE FOR THE YEAR</b>	<b>2,285</b>	<b>695</b>	<b>634</b>	<b>711</b>	<b>625</b>	<b>657</b>
<b>PROFIT/ACRE ABOVE CASH COSTS</b>						
<b>ACCUMULATED NET CASH COSTS/ACRE</b>	<b>2,285</b>	<b>2,980</b>	<b>3,614</b>	<b>4,325</b>	<b>4,950</b>	<b>5,607</b>

## UC COOPERATIVE EXTENSION

Table 1. continued

Year	Cost Per Acre					
	1st	2nd	3rd	4th	5th	6th
Tons Per Acre			1.0	2.0	3.5	4.0
Capital Recovery Cost:						
Drip Irrigation System	101	101	101	101	101	101
Land @ \$5,714 Per Producing Acre	343	343	343	343	343	343
Olive Orchard Establishment			225	225	225	225
Ladders - 10	5	5	5	5	5	5
Fuel Tanks & Pumps	4	4	4	4	4	4
Shop Building	62	62	62	62	62	62
Shop Tools	8	8	8	8	8	8
Hand Tools	4	4	4	4	4	4
Equipment	148	167	168	168	168	168
<b>TOTAL CAPITAL RECOVERY COST</b>	675	694	920	920	920	920
<b>TOTAL COST/ACRE FOR THE YEAR</b>	2,960	1,389	2,004	2,531	3,120	3,377
<b>INCOME/ACRE FROM PRODUCTION</b>			450	900	1,575	1,800
<b>TOTAL NET COST/ACRE FOR THE YEAR</b>	2,960	1,389	1,554	1,631	1,545	1,577
<b>NET PROFIT/ACRE ABOVE TOTAL COST</b>						
<b>TOTAL ACCUMULATED NET COST/ACRE</b>	2,960	4,349	5,903	7,534	9,079	10,656

Table 2.

UC COOPERATIVE EXTENSION  
COSTS PER ACRE TO PRODUCE TABLE OLIVES  
SAN JOAQUIN VALLEY – 2005

Labor Rate: \$16.59/hr. machine labor  
\$13.99/hr. non-machine labor

Interest Rate: 7.65%  
Yield per Acre: 5.0 Tons

Operation	Cash and Labor Costs per Acre						Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent	Total Cost	
<b>Cultural:</b>							
Pruning & Sucker	35.00	490	0	0	0	490	
Shred Prunings	0.29	6	3	0	0	8	
Fertilizer - Nitrogen	0.00	0	0	17	0	17	
Irrigate	0.70	10	0	155	0	165	
PCA Activities	0.00	0	0	0	12	12	
Thinning Spray (1 Out Of 2 Years)	0.00	0	0	44	31	75	
Weed Control - Spot Spray 2X	0.29	6	2	17	0	25	
Insect Control - Olive Fly 8X	0.40	8	1	64	0	73	
Pickup Truck Use	1.90	38	13	0	0	51	
ATV Use	<u>1.90</u>	<u>38</u>	<u>5</u>	<u>0</u>	<u>0</u>	<u>43</u>	
<b>TOTAL CULTURAL COSTS</b>	<b>40.48</b>	<b>595</b>	<b>24</b>	<b>297</b>	<b>43</b>	<b>959</b>	
<b>Harvest:</b>							
Hand Pick Fruit	<u>0.00</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>1,500</u>	<u>1,500</u>	
<b>TOTAL HARVEST COSTS</b>	<b>0.00</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,500</b>	<b>1,500</b>	
<b>Postharvest:</b>							
Weed Control - Fall Residual Spray	0.25	5	2	21	0	27	
Pest Control - Black Scale (1 year in 3)	0.00	0	0	24	10	34	
Disease Control - Fall Fungicide Spray	<u>0.00</u>	<u>0</u>	<u>0</u>	<u>16</u>	<u>31</u>	<u>47</u>	
<b>TOTAL POSTHARVEST COSTS</b>	<b>0.25</b>	<b>5</b>	<b>2</b>	<b>60</b>	<b>41</b>	<b>108</b>	
Interest on operating capital @ 7.65%						47	
<b>TOTAL OPERATING COSTS/ACRE</b>		<b>600</b>	<b>26</b>	<b>357</b>	<b>1,584</b>	<b>2,614</b>	
<b>CASH OVERHEAD:</b>							
Office Expense						149	
Sanitation Fees						13	
Liability Insurance						13	
Property Taxes						96	
Property Insurance						66	
Investment Repairs						<u>7</u>	
<b>TOTAL CASH OVERHEAD COSTS</b>						<b>344</b>	
<b>TOTAL CASH COSTS/ACRE</b>						<b>2,959</b>	
<b>NON-CASH OVERHEAD:</b>							
	Per producing	-- Annual Cost --					
Investment	<u>Acres</u>	<u>Capital Recovery</u>					
Drip Irrigation System	1,200	101				101	
Land	5,714	343				343	
Orchard Establishment Cost	3,614	225				225	
Fuel Tank: 1-100 Gallon	45	4				4	
Buildings	729	62				62	
Shop Tools	59	8				8	
Pruning Tools	30	4				4	
Ladders - 10	43	5				5	
Equipment	<u>1,408</u>	<u>168</u>				<u>168</u>	
<b>TOTAL NON-CASH OVERHEAD COSTS</b>	<b>12,841</b>	<b>921</b>				<b>921</b>	
<b>TOTAL COSTS/ACRE</b>						<b>3,880</b>	



Table 4.

UC COOPERATIVE EXTENSION  
MONTHLY CASH COSTS PER ACRE TO PRODUCE TABLE OLIVES  
SOUTHERN SAN JOAQUIN VALLEY – 2005

Beginning MAR 05	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	TOTAL
Ending FEB 06	05	05	05	05	05	05	05	05	05	05	06	06	
Cultural:													
Pruning & Sucker	490												490
Shred Prunings	8												8
Fertilizer - Nitrogen		17											17
Irrigate		14	20	25	29	27	26	23					165
PCA Activities			12										12
Thinning Spray (1 Out Of 2 Years)			75										75
Weed Control - Spot Spray 2X				13			13						25
Insect Control - Olive Fly 8X				18	18	18	18						73
Pickup Truck Use	4	4	4	4	4	4	4	4	4	4	4	4	51
ATV Use	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>4</u>	<u>43</u>
<b>TOTAL CULTURAL COSTS</b>	<b>506</b>	<b>39</b>	<b>115</b>	<b>64</b>	<b>55</b>	<b>54</b>	<b>65</b>	<b>31</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>959</b>
Harvest:													
Hand Pick Fruit										<u>1,500</u>			<u>1,500</u>
<b>TOTAL HARVEST COSTS</b>										<b>1,500</b>			<b>1,500</b>
Postharvest:													
Weed Control - Fall Residual Spray								27					27
Pest Control - Black Scale (1 year in 3)								34					34
Disease Control - Fall Fungicide Spray								<u>47</u>					<u>47</u>
<b>TOTAL POSTHARVEST COSTS</b>								<b>108</b>					<b>108</b>
Interest on operating capital @ 7.65%	3	3	4	5	5	5	6	16	0	0	0	0	47
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>509</b>	<b>42</b>	<b>119</b>	<b>69</b>	<b>60</b>	<b>59</b>	<b>71</b>	<b>1,655</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>2,614</b>
CASH OVERHEAD:													
Office Expense	19	19	19	19	19	19	19	19					149
Sanitation Fees	13												13
Liability Insurance	2	2	2	2	2	2	2	2					13
Property Taxes					48						48		96
Property Insurance					33						33		66
Investment Repairs	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>1</u>	<u>7</u>
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>34</b>	<b>21</b>	<b>21</b>	<b>21</b>	<b>102</b>	<b>21</b>	<b>21</b>	<b>21</b>	<b>1</b>	<b>1</b>	<b>82</b>	<b>1</b>	<b>344</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>543</b>	<b>63</b>	<b>140</b>	<b>89</b>	<b>161</b>	<b>80</b>	<b>92</b>	<b>1,676</b>	<b>8</b>	<b>8</b>	<b>89</b>	<b>8</b>	<b>2,959</b>

Table 5.

UC COOPERATIVE EXTENSION  
WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS  
SOUTHERN SAN JOAQUIN VALLEY – 2005

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead -		Total
						Insur- ance	Taxes	
05	20 Gallon Sprayer-ATV	495	10	88	61	2	3	66
05	55 HP 2WD Tractor	34,481	12	8,621	3,604	149	216	3,969
05	ATV 4WD	6,242	7	2,368	837	30	43	909
05	Mower - Flail 10'	11,132	10	1,969	1,364	45	66	1,475
05	Pickup Truck - 1/2 Ton	27,050	7	10,261	3,625	129	187	3,941
05	Weed Sprayer - 100 Gallon	2,736	10	484	335	11	16	362
TOTAL		82,136		23,791	9,826	365	530	10,721
60% of New Cost *		49,282		14,275	5,895	219	318	6,433

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

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	----- Cash Overhead -----			Total
					Insur- ance	Taxes	Repairs	
INVESTMENT								
Buildings	25,500	20	2,550	2,156	97	140	70	2,463
Drip Irrigation System	42,000	20	4,200	3,551	159	231	116	4,057
Fuel Tank: 1-100 Gallon	1,561	20	156	132	6	9	30	176
Ladders - 10	1,498	10	150	192	6	8	9	215
Land	200,000	60	200,000	12,020	1,380	2,000	0	15,400
Orchard Establishment Cost	126,490	57		7,885	436	632	0	8,954
Pruning Tools	1,040	10	104	133	4	6	6	149
Shop Tools	2,081	10	208	267	8	11	15	301
TOTAL INVESTMENT	400,170		207,368	26,336	2,096	3,038	246	31,716

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/ Unit	Total Cost
	Farm	Unit		
Liability Insurance	40	Acre	13.23	529
Office Expense	35	Acre	148.57	5,200
Sanitation Fees	35	Acre	13.43	470



Table 6.

UC COOPERATIVE EXTENSION  
 HOURLY EQUIPMENT COSTS  
 SOUTHERN SAN JOAQUIN VALLEY – 2005

Yr	Description	Actual Hours Used	----- COSTS PER HOUR -----							Total Costs/Hr.
			Capital Recovery	- Cash Overhead -			----- Operating -----			
				Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.		
05	20 Gallon Sprayer-ATV	14.0	2.60	0.09	0.12	0.13	0.00	0.13	2.94	
05	55 HP 2WD Tractor	31.7	68.19	2.81	4.08	1.54	4.69	6.23	81.31	
05	ATV 4WD	80.6	6.23	0.22	0.32	0.46	2.36	2.82	9.58	
05	Mower - Flail 10'	10.0	81.83	2.71	3.93	2.84	0.00	2.84	91.32	
05	Pickup Truck - 1/2 Ton	66.6	32.65	1.16	1.68	1.99	4.71	6.70	42.19	
05	Weed Sprayer - 100 Gallon	18.8	10.68	0.35	0.51	0.73	0.00	0.73	12.28	

Table 7.

UC COOPERATIVE EXTENSION  
RANGING ANALYSIS  
SOUTHERN SAN JOAQUIN VALLEY – 2005

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE TABLE OLIVES							
	YIELD (TON/ACRE)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
<b>OPERATING COSTS/ACRE:</b>							
Cultural Cost	959	959	959	959	959	959	959
Harvest Cost	1,050	1,200	1,350	1,500	1,650	1,800	1,950
Postharvest Cost	108	108	108	108	108	108	108
Interest on operating capital	44	45	46	47	48	49	50
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>2,161</b>	<b>2,312</b>	<b>2,463</b>	<b>2,614</b>	<b>2,765</b>	<b>2,916</b>	<b>3,067</b>
<b>TOTAL OPERATING COSTS/TON</b>	<b>618</b>	<b>578</b>	<b>547</b>	<b>523</b>	<b>503</b>	<b>486</b>	<b>472</b>
<b>CASH OVERHEAD COSTS/ACRE</b>	<b>344</b>	<b>344</b>	<b>344</b>	<b>344</b>	<b>344</b>	<b>344</b>	<b>344</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>2,506</b>	<b>2,657</b>	<b>2,808</b>	<b>2,959</b>	<b>3,110</b>	<b>3,261</b>	<b>3,411</b>
<b>TOTAL CASH COSTS/TON</b>	<b>716</b>	<b>664</b>	<b>624</b>	<b>592</b>	<b>565</b>	<b>543</b>	<b>525</b>
<b>NON-CASH OVERHEAD COSTS/ACRE</b>	<b>921</b>	<b>921</b>	<b>921</b>	<b>921</b>	<b>921</b>	<b>921</b>	<b>921</b>
<b>TOTAL COSTS/ACRE</b>	<b>3,427</b>	<b>3,578</b>	<b>3,729</b>	<b>3,880</b>	<b>4,030</b>	<b>4,181</b>	<b>4,332</b>
<b>TOTAL COSTS/TON</b>	<b>979</b>	<b>894</b>	<b>829</b>	<b>776</b>	<b>733</b>	<b>697</b>	<b>667</b>

NET RETURNS PER ACRE ABOVE OPERATING COSTS							
PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
TABLE OLIVE							
300	-1,184	-1,185	-1,186	-1,187	-1,188	-1,189	-1,190
350	-1,009	-985	-961	-937	-913	-889	-865
400	-834	-785	-736	-687	-638	-589	-540
450	-659	-585	-511	-437	-363	-289	-215
500	-484	-385	-286	-187	-88	11	110
550	-309	-185	-61	63	187	311	435
600	-134	15	164	313	462	611	760

NET RETURNS PER ACRE ABOVE CASH COSTS							
PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
TABLE OLIVE							
300	-1,456	-1,457	-1,458	-1,459	-1,460	-1,461	-1,461
350	-1,281	-1,257	-1,233	-1,209	-1,185	-1,161	-1,136
400	-1,106	-1,057	-1,008	-959	-910	-861	-811
450	-931	-857	-783	-709	-635	-561	-486
500	-756	-657	-558	-459	-360	-261	-161
550	-581	-457	-333	-209	-85	39	164
600	-406	-257	-108	41	190	339	489

NET RETURNS PER ACRE ABOVE TOTAL COSTS							
PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
	3.5	4.0	4.5	5.0	5.5	6.0	6.5
TABLE OLIVE							
300	-2,449	-2,450	-2,451	-2,452	-2,453	-2,454	-2,455
350	-2,274	-2,250	-2,226	-2,202	-2,178	-2,154	-2,130
400	-2,099	-2,050	-2,001	-1,952	-1,903	-1,854	-1,805
450	-1,924	-1,850	-1,776	-1,702	-1,628	-1,554	-1,480
500	-1,749	-1,650	-1,551	-1,452	-1,353	-1,254	-1,155
550	-1,574	-1,450	-1,326	-1,202	-1,078	-954	-830
600	-1,399	-1,250	-1,101	-952	-803	-654	-505

Table 8.

UC COOPERATIVE EXTENSION  
COSTS AND RETURNS / BREAKEVEN ANALYSIS  
SOUTHERN SAN JOAQUIN VALLEY – 2005

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)
Table Olives	2,250	2,614	-364	2,959	-709	3,880	-1,630

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)
Table Olives	78,750	91,502	-12,752	103,551	-24,801	135,783	-57,033

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 -----					
Table Olives	5.0	Ton	522.87	591.72	775.90

BREAKEVEN YIELDS PER ACRE					
----- Breakeven Yield To Cover -----					
CROP	Yield Units	Base Price (\$/Unit)	Operating Costs	Cash Costs	Total Costs
----- Yield Units / Acre -----					
Table Olives	Ton	450.00	5.8	6.6	8.6

Table 9.

UC COOPERATIVE EXTENSION  
 DETAIL OF OPERATIONS – TABLE OLIVES  
 SOUTHERN SAN JOAQUIN VALLEY – 2005

Operation	Operation Month	Tractor/ Power Unit	Implement	Material	Broadcast Rate/acre	Material Unit
Cultural:						
Pruning & Sucker	March	Labor				
Brush Disposal - Mowing	March	55 HP 2WD Tractor	Mower - Flail 10'			
Irrigate	April	Labor		Water	3.00	AcIn
	May	Labor		Water	4.50	AcIn
	June	Labor		Water	5.75	AcIn
	July	Labor		Water	6.50	AcIn
	August	Labor		Water	6.25	AcIn
	September	Labor		Water	6.00	AcIn
	October	Labor		Water	5.20	AcIn
Fertilizer - Nitrogen	April	Labor		UN-32	45.00	Lb N
PCA Activities	May	Custom		PCA Fees	1.00	Acre
Thinning Spray (1 Out of 2 Years)	May	Ground Application		Contract	1.00	Acre
				Liqua-stik	36.00	Oz
Weed Control - Spot Spray 2X	June	55 HP 2WD Tractor	Weed Sprayer - 100 Gal	Roundup Ultra Max	1.00	Pint
	September	55 HP 2WD Tractor	Weed Sprayer - 100 Gal	Roundup Ultra Max	1.00	Pint
Insect Control - Olive Fly Spray 8X	June	ATV 4WD	20 Gallon Sprayer-ATV	Spinosad	28.00	Oz
	July	ATV 4WD	20 Gallon Sprayer-ATV	Spinosad	28.00	Oz
	August	ATV 4WD	20 Gallon Sprayer-ATV	Spinosad	28.00	Oz
	September	ATV 4WD	20 Gallon Sprayer-ATV	Spinosad	28.00	Oz
Harvest - Hand Pick Fruit	October	Custom		Harvest Olives	5.00	Ton
Weed Control - Winter Strip Spray	October	55 HP 2WD Tractor	Weed Sprayer - 100 Gal	Princep Caliber 90	2.00	Lb
				Karmex DF	2.00	Lb
Pest Control - Black Scale - (1 Out of 3 Years)	October	Ground Application		Contract	0.33	Acre
				Supracide 2E	0.33	Gal
Disease Control - Fall Fungicide Spray	October	Ground Application		Contract	1.00	Acre
				Kocide 101	8.00	Lb
Pickup Truck Use	All Months					
ATV Use	All Months					