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UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2005

SAMPLE COSTS TO  
ESTABLISH AND PRODUCE  
**POMEGRANATES**



SAN JOAQUIN VALLEY - SOUTH  
Furrow Irrigation

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**San Joaquin Valley -2005**

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University of California and the United States Department of Agriculture, Risk Management Agency, Cooperating

**INTRODUCTION**

Sample costs to establish an orchard and produce pomegranates in the southern 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. The production practices described in this study are those considered typical for growing pomegranates in the San Joaquin Valley, but they 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 3 and 4 is provided to enter your farm 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 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 and produce pomegranates in the southern San Joaquin Valley. The cultural practices shown represent production operations and materials considered typical of a well-managed orchard in the region. Costs, materials, and practices in this study will not apply to all farms. Timing of and types of cultural practices will vary among growers within the region and from season to season due to variables such as variety, weather, soil, and insect and disease pressure. **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.**

**Land.** The farm consists of 100 contiguous acres; 10 acres are being planted to pomegranates and will reach maturity in six to seven years. Other orchard and vine crops are grown on 85 acres; the remaining five acres are roads and farmstead. The owner farms the orchard.

### Orchard Establishment Operating Costs

Tables 1 and 2

**Site Preparation.** This orchard is established on ground that has been previously planted to other tree, field or row crops. The land is assumed to be deep, well drained, and either a class I or II soil. The orchard site allows for a uniform water flow (i.e. flood or furrow irrigation). Custom operators begin land preparation by slip plowing the soil profile to four to five feet deep in the tree row and subsoiling the middles four to five feet deep in order to break up any underlying hardpan or mix stratified soils that would affect root penetration and water infiltration. Following ripping and slip plowing, the ground is disked three times, then flood irrigated, laser leveled once and floated twice. For purposes of this report all land preparation is included in the first year costs.

**Trees.** No specific variety is grown in this study, but the common varieties grown in the region are Foothill Early, that is harvested beginning mid to late August, Early Wonderful that is harvested in early September and Wonderful, that is harvested beginning in mid to late September. The bareroot trees in this study are planted on an 18-foot X 18-foot (tree x row) spacing, 134 trees per acre. Some new plantings are being planted on closer spacings. The life of the orchard at the time of planting in this study is estimated to be 25 years.

**Plant.** Planting the orchard starts in January by marking tree sites, digging holes, planting, and pruning (headedback). Immediately after planting, berms are put up in the tree row. In the second year, 1% of the trees or two trees per acre are planted to replace dead and/or weak trees. The nursery furnishes these trees free and the grower incurs the replanting costs.

**Prune/Sucker.** In the first year, the new trees are topped (headedback) at planting and suckered in June. Regular pruning and suckering begins in January of the second year with additional suckering in June. Beginning in the third year, the January prunings and the June pruned suckers are placed in the row middles and shredded with the grower's equipment. Depending upon the amount of prunings produced, shredding may not be needed after every pruning or suckering. Pomegranates produce many suckers from the base of the tree and are removed to form a single trunk.

**Irrigation.** Water costs include water at \$3.00 per acre-inch (\$36 per acre-foot) and irrigation labor at 1.0 hour per irrigation. Price per acre-foot for water will vary depending on the irrigation district, and/or various well characteristics, and other irrigation factors. Assuming 80% irrigation efficiency, the amount of water applied to the orchard during the establishment period is shown in Table A. Applied water values are substantially greater than the actual tree water requirement due to application inefficiency. In addition to the 10-acre inches applied the first year, 10 acre-inches were applied during land preparation after ripping to settle the ground. Water is delivered to the orchard from the well or district ditch through an underground pipe and flood valve system to furrows along the tree rows. No assumption is made about effective rainfall. If leveling costs will be excessive, pressurized irrigation systems should be considered which do not require leveling. Irrigation furrows are made with the grower's tractor and crowder implement after planting to establish a permanent tillage reduced irrigation system.

Year	Acre-inches per Year
1	10.00
2	15.00
3	27.50
4	37.50
5	45.00

**Fertilization.** Nitrogen is the major nutrient required for proper tree growth and optimum yields. Nitrogen fertilizer (ammonium nitrate) is applied by hand during the first two years and the amount applied increases each year up to the fourth year. Beginning in the third year, the fertilizer is applied with the grower's tractor and a broadcast spreader that is furnished by the fertilizer dealer. Annual rates of actual N applied in this study are shown in Table B.

Year	Pounds of N/Acre
1	16.75
2	26.80
3	44.22
4+	100.00

**Pest Management.** The number of pesticides available for pomegranates is limited. Pesticides mentioned in the study are those commonly used.

**Weeds.** The tree row (berm) is sprayed with Surflan immediately after the berm is made and again in January of the second year. Beginning in the third season the berms (tree row) are sprayed during the dormant season (January) with the preemergent herbicides, Goal and Surflan. The irrigation furrows (middles) are sprayed with Roundup four to six times per year – February, April, June, July, September. Five percent of the acreage is also spot sprayed in May and July with Roundup. The irrigation furrows are cleaned once each year with the grower's tractor and crowder or center sweeps.

**Insects.** Insects treated in this study beginning in the third year are mites (flat mite [*Brevipalpus lewisi*]), and worms (omnivorous leaf roller [*Platynola stultana*]). Lannate (or phosphate soap) is applied for aphid control in April. Dusting Sulfur (or wettable) for mite control is applied twice, once in May and once in June. Also, Dipel for worm control is applied in July. The grower makes all applications.

**Disease.** Not commonly affected by any serious diseases. They can and will get both *Botrytis* and *Alternaria* (heart rot), but there are currently no registered controls for either.

**Harvest.** Harvest starts in the third leaf. Harvest costs will vary according to yield. The crop is harvested by hand and hauled to the packing shed for cooling, storing, and selling. Crew sizes will vary, but a crew of 10 is assumed in this study for the third and fourth years with the grower furnishing one tractor with a bin trailer. Thereafter, a crew of 20 is assumed and the grower furnishes two tractors and two bin trailers.

Year	*Boxes/acre
3	75
4	150
5	225
6+	300

\*Boxes = 28 lbs.

**Yields and Returns.** Although Pomegranates begin bearing an economic crop in the third year after planting, yield maturity is not reached until the sixth year. Typical annual yields for the common varieties are shown in Table C.

## Production Cultural Operating Costs – Mature Trees

**Prune & Sucker.** Pruning and suckering are done by hand in the winter months, January. The prunings are placed in the middles and shredded by the grower. The trees are suckered again in June and depending upon how many suckers are removed, shredding may be needed. For this study, it is assumed that shredding is needed. In some areas, growers summer prune along with the suckering. After which the prunings are shredded

**Irrigation.** The cost includes water pumping or district costs at \$3.25 per acre-inch (\$39 per acre-foot) and irrigation labor at one hour per acre per irrigation. Price per acre-foot for water will vary depending on the irrigation district, and/or various well characteristics, and other irrigation factors. The irrigation period is typically from April through early September. The trees are irrigated a total of 9 times (1X each in April, May, September and 2X in June, July, August). An irrigation may be needed in March for frost protection. The trees are assumed to have a seasonal consumptive water use of 36 acre-inches. Typically furrow irrigation is only 80% efficient so 45 acre-inches is applied to the orchard. Water is delivered to the orchard from the well or district ditch through an underground pipe and flood valve system to furrows along the tree rows. No assumption is made about effective rainfall.

**Fertilization.** Nitrogen (N) fertilizer is applied in March or April at 75-125 of N per acre. The grower spreads the fertilizer with a spreader furnished free by the fertilizer company.

*Leaf Sampling.* Leaf - tissue samples - sampling for nutritional analyses are not included in this study but should be taken in June or July and the fertilizers applied according to the recommendations.

**Pest Management.** For information on pesticides available, pest identification, monitoring, and management contact your UC Cooperative Extension Farm Advisor or local Pest Control Adviser. For information and pesticide use permits, contact the local county Agricultural Commissioner's office. **Pesticides mentioned in this study are used to calculate rates and costs. Although growers commonly use the pesticides mentioned, other pesticides may be available.** Materials for pomegranates are limited. Adjuvants are recommended for use with many pesticides for effective control, but the adjuvants and their costs are not included in this study. Pesticide costs may vary by location, brand, and grower volume. Pesticide costs in this study are taken from a single dealer and shown as full retail.

*Pest Control Adviser (PCA).* Written recommendations are required for many commercially applied pesticides and are written by licensed pest control advisers. In addition the PCA will monitor the field for agronomic problems including pests, diseases, and nutritional status. Growers may hire private PCA's or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. The grower has a full service agreement with the company.

*Weed.* Weeds are controlled in the tree rows (berm) during the winter (January) with residual pre-emergence herbicides – Goal and Surflan combination. In May and July, the grower uses an ATV and sprayer to apply Roundup as a spot spray (weedy spots) in the tree row. Irrigation furrows made in the first year are cleaned once each year with the crowder or similar type implement. The weeds are controlled in the row middles (furrows) during the spring and summer – February, April, June, July, September – by chemical mowing (Roundup).

*Insects.* Insects treated in this study are mites (flat mite [*Brevipalpus lewisi*]), and worms (omnivorous leaf roller [*Platynola stultana*]). Lannate (or insecticidal soaps) is applied for aphid control in April or May and

Dusting Sulfur (or wettable) for mite control is applied twice by ground once in May and once in June. Also, Dipel for worm control is applied in July. The grower makes all applications.

**Diseases.** Not commonly affected by any serious diseases. They can and will get both *Botrytis* and *Alternaria* (heart rot), but there are currently no registered controls for either.

**Harvest.** The pomegranate orchard reaches full maturity in the sixth year. The harvests costs will vary according to yield. The grower’s picking crew (20 pickers) using ladders and bags supplied by an independently owned and operated packing shed harvests the crop. The grower furnishes two tractors and trailers for moving the bins around the field. The picked fruit is placed into half-ton plastic or wooden field bins. The plastic field bins hold approximately 1,000 pounds of fruit, but in reality bins are filled to 800 to 900 pounds. Typically, the field packouts are in the 60% to 80% range, with 80% being used in this study. The fruit is hauled to the packing shed by a contract hauler for \$5.50 per bin. The shed packs, palletizes, cools and sells (10% of grower price) the fruit under a contract with the grower. Packing charges are assumed to be \$3.35 to \$3.50 per box. The crop is harvested two to three times (two times in this study) for the fresh fruit market.

**Yields.** Average annual yields for pomegranates are measured in boxes per acre. The weight of a box of pomegranates in this study is 28 pounds. An average annual yield over the remaining life of the orchard in this study is 300 boxes per acre. Average county yields for fresh market pomegranates are shown in Table D. The averages include all pomegranate varieties and orchards in various stages of production. Industry box sizes can vary and yield by box conversions will be required.

Year	Tons/Acre <sup>1</sup>	Boxes/Acre <sup>2</sup>
2000	4.98	356
2001	5.67	405
2002	3.86	275
2003	4.62	330
2004	4.66	333

<sup>1</sup> Source: Ag Commissioner Crop Reports Fresno, Tulare <sup>2</sup> Boxes weigh 28 pounds

**Returns.** An estimated price of \$14.25 per 28-pound box is based on the Fresno and Tulare Counties’ Ag Commissioner annual crop report over the last five years and is used in this study to determine income over a range of prices and yields. Return prices for fresh market pomegranates at different yields and prices are shown in Table 6. Although not considered in this study, growers may have the option to sell the culls or entire crop for juice. Currently, there is not a stable juice market and prices vary considerably between seasons.

**Pickup/ATV.** The study assumes a business use mileage of 150 miles per acre per year or 15,000 miles for the farm. The ATV is used for spot spraying and is included in those specific costs. Use of the ATV for monitoring the orchard and checking the irrigation is shown under the ATV operation and assumes a use of 3-hours per acre.

**Labor.** Labor rates of \$14.30 per hour for machine operators and \$9.65 for general labor includes payroll overhead of 43%. The basic hourly wages are \$10.00 for machine operators and \$6.75 for general labor. The overhead includes the employers’ share of federal and California state payroll taxes, workers’ compensation insurance for orchard/fruit crops (code 0016), and a percentage for other possible benefits. Workers’ compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 5, 2005 (California Department of Insurance). Labor for operations involving machinery are 20% higher than the operation time given in Table 3 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Wages for management are not included as a cash cost. Any return above total costs is considered a return to management and risk. However, growers wanting to account for management may wish to add a fee. The manager makes all production decisions including cultural practices, action to be taken on pest management recommendations, and labor.

**Equipment Operating Costs.** Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by American Society of Agricultural Engineers (ASAE). Fuel and lubrication costs are also determined by ASAE equations based on maximum Power Take Off (PTO) horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$1.51 and \$2.05 per gallon, respectively. The cost includes a 2% local sales tax on diesel fuel and 8% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in Table 3 is determined by multiplying the total hourly operating cost in Table 8 for each piece of equipment used for the selected operation 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.** Production risks 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.

### **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 100-acre farm or \$5.57 per producing acre (95 acres).

**Office Expense.** Office and business expenses are estimated at \$65.00 per producing acre (95 acres). These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges. The cost is a general estimate and not based on any actual data.

**Sanitation Services.** Sanitation services provide double portable toilets, washbasins, soap, and towels for the orchard and cost the farm \$235 per month. The monthly service charge is an average of four to six California sanitation companies and locations. The cost includes delivery and 5 months of weekly service. The sanitation costs are estimated and not based on any specific data. Growers using contract labor may not have a cost because many labor contractors provide their own sanitation facilities.

**Management/Supervisor Salaries.** The grower farms the orchard; therefore no salaries are included for management. Returns above costs are considered a return to management.

**Investment Repairs.** Annual maintenance is calculated as two percent of the purchase price.

## Non-Cash Overhead

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

*Salvage Value.* Salvage value is an estimate of the remaining value of an investment at the end of its 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.

**Establishment Cost.** Costs to establish the orchard are used to determine capital recovery expenses, depreciation, and interest on investment for the production years. Establishment cost is the sum of the costs for land preparation, planting, trees, cash overhead and production expenses for growing the trees through the first year that plums are harvested minus any returns from production. In Table 1, the Total Accumulated Net Cash Cost in the third year represents the establishment cost. For this study the cost is \$3,152 per producing acre or \$31,520 for the 10-acre orchard. The establishment cost is spread over the remaining 22 producing years of the 25 years of orchard life.

**Irrigation System.** For this study, the orchard is irrigated down furrows that are chemically mowed several times during the growing season. Water is delivered to the orchard from the district ditch or deep well and distributed to the orchard by way of underground mainlines and valves. The irrigation system is installed before the orchard is planted. The life of the irrigation system is estimated at 25 years. The irrigation system is considered an improvement to the property and is shown in the capital recovery sections in the tables. Pressurized (micro-sprinkler) systems may be used in some orchards, but the initial capital costs are higher.



**Land.** The orchard is established on ground previously planted to deciduous trees or vines. Field or row cropland costs range from \$2,000 to \$5,500 per acre (Trends in Ag and Land Lease Values). Land in this study is valued at \$3,750 per acre or \$3,947 per producing acre. Land values with tree crops (includes the tree value) range from \$4,500 to \$9,000 per acre.

**Building.** The buildings total 1,800 square feet and are metal building/buildings on a cement slab.

**Tools.** This includes shop tools, hand tools, and miscellaneous field tools such as pruning tools.

**Fuel Tanks.** Two 250-gallon fuel tanks using gravity feed are on metal stands. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

**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. Annual ownership costs for equipment and other investments are shown in the Whole Farm Annual Equipment, Investment, and Business Overhead Costs table. 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.

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**Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A POMEGRANATE ORCHARD**  
 SAN JOAQUIN VALLEY – South 2005

	Costs Per Acre				
	Year:	1st	2nd	3rd	4th
Yield: 28 Pound Boxes Per Acre				75	150
<b>Planting Costs:</b>					
Land Preparation: Slip Plow (Custom)	350				
Land Preparation: Disc 3X (Custom)	60				
Land Prep: Put Up Borders	6				
Irrigate: water & labor	54				
Land Preparation: Level (Custom)	125				
Land Preparation: Float 2X (Custom)	24				
Plant: Layout, Plant, Top Trees (Contract Labor)	67	2			
Trees: 134 Per Acre @ \$5/tree	670	10			
<b>TOTAL PLANTING COSTS</b>	<b>1,356</b>	<b>12</b>			
<b>Cultural Costs:</b>					
Weed: Dormant Strip (Yr 1-2, Surflan. Yr 3+, Surflan, Goal)	45	45	65	65	
Prune & Sucker Trees: (Winter)		43	86	151	
Prune: Shred Prunings (Yr 3, 1X. Yr 4, 2X)			10	26	
Weed: Spray Middles 5X (Yr 1, 4X) (Roundup)	59	74	74	74	
Irrigation: Furrow Middles	4	4	4	4	
Irrigate 9X (water & labor)	114	136	176	209	
Insect: Aphid (Lannate)			39	39	
Sucker Trees (Summer)	11	22	43	43	
Fertilizer: N (46-0-0)	12	17	25	35	
Weed: Spot Spray (Roundup)		5	5	9	
Insect: Mites (Sulfur Dust)			38	38	
Insect: Worms (Dipel)			37	37	
Plant: Put Up Berms	6				
Pickup Truck Use	124	124	124	124	
ATV	55	55	55	55	
<b>TOTAL CULTURAL COSTS</b>	<b>430</b>	<b>525</b>	<b>781</b>	<b>909</b>	
<b>Harvest Costs:</b>					
Pick Fruit			87	176	
Haul to Shed			16	38	
Pack Fruit			263	525	
Sell			107	214	
<b>TOTAL HARVEST COSTS</b>			<b>473</b>	<b>953</b>	
Interest On Operating Capital @ 7.65%	116	20	34	44	
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>1,902</b>	<b>557</b>	<b>1,288</b>	<b>1,906</b>	
<b>Cash Overhead Costs:</b>					
Office Expense	65	65	65	65	
Liability Insurance	6	6	6	6	
Sanitation Fees	12	12	12	12	
Property Taxes	48	48	48	49	
Property Insurance	6	6	6	6	
Investment Repairs	21	21	21	21	
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>158</b>	<b>158</b>	<b>158</b>	<b>159</b>	
<b>TOTAL CASH COSTS/ACRE</b>	<b>2,060</b>	<b>715</b>	<b>1,446</b>	<b>2,065</b>	
<b>INCOME/ACRE FROM PRODUCTION</b>			<b>1,069</b>	<b>2,138</b>	
<b>NET CASH COSTS/ACRE FOR THE YEAR</b>	<b>2,060</b>	<b>715</b>	<b>377</b>		
<b>PROFIT/ACRE ABOVE CASH COSTS</b>				<b>73</b>	
<b>ACCUMULATED NET CASH COSTS/ACRE</b>	<b>2,060</b>	<b>2,775</b>	<b>3,152</b>	<b>3,080</b>	

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Table 1. continued

	Year	Costs Per Acre			
		1st	2nd	3rd	4th
Yield: 28 Pound Boxes Per Acre				75	150
Capital Recovery Cost:					
Shop Building		41	41	41	41
Land		237	237	237	237
Fuel Tank & Pump		3	3	3	3
Shop Tools		12	12	12	12
Furrow Irrigation System		34	34	34	34
Equipment		56	56	81	75
TOTAL NON-CASH OVERHEAD COST/ACRE		383	383	408	402
TOTAL COST/ACRE FOR THE YEAR		2,443	1,098	1,854	2,467
INCOME/ACRE FROM PRODUCTION				1,069	2,138
TOTAL NET COST/ACRE FOR THE YEAR		2,443	1,098	785	330
NET PROFIT/ACRE ABOVE TOTAL COST				0	0
TOTAL ACCUMULATED NET COST/ACRE		2,443	3,541	4,326	4,656

UC COOPERATIVE EXTENSION  
**Table 2. MATERIALS AND CUSTOM WORK COSTS PER ACRE - ESTABLISHMENT YEARS**  
 SAN JOAQUIN VALLEY – South 2005

	Unit	\$/Unit	Year 1		Year 2		Year 3		Year 4	
			Total Per Acre							
			units	\$	units	\$	units	\$	units	\$
<b>OPERATING COSTS</b>										
<b>Custom:</b>										
Slip Plow	acre	350.00	1.00	350		0		0		0
Disk	acre	20.00	3.00	60		0		0		0
Fumigate-Solid, Methyl Bromide						0		0		0
Laser Level	acre	125.00	1.00	125		0		0		0
Float	acre	12.00	2.00	24		0		0		0
Layout, Plant, Top	tree	0.50	134.00	67		0		0		0
Replant	tree	1.00		0	2.00	2		0		0
Ground Application (Dust)	lb	0.35		0		0		0	0.00	0
Haul Bins	bin	5.50		0		0	3.00	17	7.00	39
Pack Fruit	box	3.50		0		0	75.00	263	150.00	525
Sell Fruit @ 10% Sales Price	box	1.43		0		0	75.00	107	150.00	214
<b>Tree/Tree Aids:</b>										
Pomegranate Tree	tree	5.00	134.00	670	2.00	10		0		0
<b>Irrigation:</b>										
Water (preirrigate)	acin	3.25	10.00	33		0		0		0
Water (growing season)	acin	3.25	8.00	26	15.00	49	27.50	89	37.50	122
<b>Fertilizer:</b>										
Ammonium Nitrate (34-0-0)	lb	0.46	16.75	8	26.80	12	44.22	20	67.00	30
<b>Herbicide:</b>										
Goal 2XL	pint	16.25	0.00	0		0	2.00	33	2.00	33
Surflan 4 AS	pint	13.07	3.00	39	3.00	39	2.00	26	2.00	26
Roundup Ultra Max	pint	8.56	4.00	34	5.10	44	5.10	44	5.20	45
<b>Insecticide:</b>										
Dusting Sulfur 98	lb	0.25		0		0	100.00	25	100.00	25
Dipel DF	lb	13.75		0		0	2.00	28	2.00	28
Lannate SP	lb	29.23		0		0	1.00	29	1.00	29
<b>Labor (machine)</b>	hrs	14.30	11.93	171	12.03	172	15.12	216	16.80	240
<b>Labor (non-machine)</b>	hrs	9.65	12.88	124	16.25	157	29.80	288	43.86	423
<b>Fuel - Gas</b>	gal	2.05	0.91	2	0.97	2	0.97	2	1.03	2
<b>Fuel - Diesel</b>	gal	1.51	20.36	31	19.24	29	26.13	39	30.58	46
<b>Lube</b>				5		5		6		7
<b>Machinery repair</b>				17		16		22		28
<b>Interest @ 7.65%</b>				116		20		34		44
<b>Total Operating Costs/Acre</b>				1,901		557		1,287		1,905

UC COOPERATIVE EXTENSION  
**Table 3. COSTS PER ACRE TO PRODUCE POMEGRANATES**  
 SAN JOAQUIN VALLEY - South 2005

Operation	Operation Time (Hrs/A)	Field Labor	Cash and Labor Costs per Acre				Total Cost	Your Cost
			Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
Cultural:								
Weed: Dormant Strip (Surflan, Goal)	0.28	0.00	5	1	59	0	65	
Prune: Prune & Sucker Trees (winter)	0.00	26.80	259	0	0	0	259	
Prune: Shred Brush 2X	0.86	0.00	15	11	0	0	26	
Weed: Spray Middles 5X (Roundup)	1.41	0.00	24	7	43	0	74	
Weed: Furrow Middles	0.14	0.00	2	1	0	0	4	
Irrigate: Furrow 9X (water & labor)	0.00	9.00	87	0	146	0	233	
Insect: Aphid (Lannate)	0.31	0.00	5.25	4.11	29.23	0	39	
Fertilize: N (46-0-0)	0.21	0.00	3.57	0.84	45.5	0	50	
Weed: Spot Spray 2X (Roundup) ATV	0.40	0.00	7	1	2	0	9	
Insect: Mites (Dusting Sulfur) 2X	0.61	0.00	11	3	25	0	38	
Prune: Sucker Trees (summer)	0.00	4.50	43	0	0	0	43	
Insect: Worms (Dipel)	0.31	0.00	5	4	28	0	37	
Pickup: Farm Use	5.00	0.00	86	38	0	0	124	
ATV: Irrigation & General Field Use	3.00	0.00	51	3	0	0	55	
<b>TOTAL CULTURAL COSTS</b>	<b>12.53</b>	<b>40.30</b>	<b>604</b>	<b>75</b>	<b>377</b>	<b>0</b>	<b>1,055</b>	
Harvest:								
Pick Fruit	1.48	29.54	336	26	0	0	361	
Haul To Shed	0.00	0.00	0	0	0	72	72	
Pack Fruit	0.00	0.00	0	0	0	1,050	1,050	
Sell @ 10% of Returns	0.00	0.00	0	0	0	428	428	
<b>TOTAL HARVEST COSTS</b>	<b>1.48</b>	<b>29.54</b>	<b>336</b>	<b>26</b>	<b>0</b>	<b>1,549</b>	<b>1,910</b>	
Interest on operating capital @ 7.65%							62	
<b>TOTAL OPERATING COSTS/ACRE</b>			<b>940</b>	<b>100</b>	<b>377</b>	<b>1,549</b>	<b>3,028</b>	
CASH OVERHEAD:								
Office Expense							65	
Liability Insurance							6	
Sanitation Fees							12	
Property Taxes							65	
Property Insurance							17	
Investment Repairs							84	
<b>TOTAL CASH OVERHEAD COSTS</b>							<b>249</b>	
<b>TOTAL CASH COSTS/ACRE</b>							<b>3,277</b>	
NON-CASH OVERHEAD:								
			Per producing Acre		Annual Cost Capital Recovery			
Buildings			474		41		41	
Fuel Tanks			37		3		3	
Shop Tools			126		12		12	
Irrigation System - Flood			430		34		34	
Orchard Establishment			3,947		237		237	
Land			3,152		262		262	
Equipment			686		99		99	
<b>TOTAL NON-CASH OVERHEAD COSTS</b>			<b>8,852</b>		<b>688</b>		<b>688</b>	
<b>TOTAL COSTS/ACRE</b>							<b>3,966</b>	

UC COOPERATIVE EXTENSION  
**Table 4. COSTS AND RETURNS PER ACRE TO PRODUCE POMEGRANATES**  
 SAN JOAQUIN VALLEY - South 2005

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>GROSS RETURNS</b>					
Pomegranate	300.00	box	14.25	4,275	
<b>OPERATING COSTS</b>					
<b>Herbicide:</b>					
Surflan 4 AS	2.00	pint	13.07	26	
Goal 2 XL	2.00	pint	16.45	33	
Roundup Ultra Max	5.20	pint	8.56	45	
<b>Irrigate:</b>					
Water	45.00	acin	3.25	146	
<b>Fertilizer:</b>					
Ammonium Nitrate 34-0-0	100.00	lb N	0.46	46	
<b>Insecticide:</b>					
Lannate SP	1.00	lb	29.23	29	
Dusting Sulfur 98	100.00	lb	0.25	25	
Dipel DF	2.00	lb	13.75	28	
<b>Custom/Contract:</b>					
Haul Fruit (field to packing shed)	13.00	bin	5.50	72	
Pack Fruit	300.00	box	3.50	1,050	
Sell @ 10% of Returns	300.00	box	1.425	428	
<b>Labor (machine)</b>	18.57	hrs	14.30	266	
<b>Labor (non-machine)</b>	69.84	hrs	9.65	674	
<b>Fuel - Gas</b>	1.03	gal	2.05	2	
<b>Fuel - Diesel</b>	36.97	gal	1.51	56	
<b>Lube</b>				9	
<b>Machinery repair</b>				34	
<b>Interest on operating capital @ 7.65%</b>				62	
<b>TOTAL OPERATING COSTS/ACRE</b>				<b>3,028</b>	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				<b>1,247</b>	
<b>CASH OVERHEAD COSTS:</b>					
Office Expense				65	
Liability Insurance				6	
Sanitation Fees				12	
Property Taxes				65	
Property Insurance				17	
Investment Repairs				84	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>				<b>249</b>	
<b>TOTAL CASH COSTS/ACRE</b>				<b>3,277</b>	
<b>NON-CASH OVERHEAD COSTS (Capital Recovery)</b>					
Buildings				41	
Fuel Tanks				3	
Shop Tools				12	
Irrigation System - Flood				34	
Orchard Establishment				237	
Land				262	
Equipment				99	
<b>TOTAL NON-CASH OVERHEAD COSTS/ACRE</b>				<b>688</b>	
<b>TOTAL COSTS/ACRE</b>				<b>3,965</b>	
<b>NET RETURNS ABOVE TOTAL COSTS</b>				<b>310</b>	

UC COOPERATIVE EXTENSION  
**Table 5. MONTHLY CASH COSTS PER ACRE TO PRODUCE POMEGRANATES**  
 SAN JOAQUIN VALLEY - South 2005

Beginning JAN 05	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 05	05	05	05	05	05	05	05	05	05	05	05	05	
Cultural:													
Weed: Dormant Strip (Surflan, Goal)	65												65
Prune: Prune & Sucker Trees (winter)	259												259
Prune: Shred Brush 2X	13					13							26
Weed: Spray Middles 5X (Roundup)		15		15		15	15		15				74
Weed: Furrow Middles (1X per 4 years)				4									4
Irrigate: Furrow 9X (water & labor)				22	22	56	56	52	26				233
Insect: Aphid (Lannate)				39									39
Fertilize: N (46-0-0)					50								50
Weed: Spot Spray 2X (Roundup) ATV					5		5						9
Insect: Mites (Dusting sulfur) 2X					19	19							39
Prune: Sucker Trees (summer)						43							43
Insect: Worms (Dipel)							37						37
Pickup: Farm Use	10	10	10	10	10	10	10	10	10	10	10	10	124
ATV: Irrigation & General Field Use	5	5	5	5	5	5	5	5	5	5	5	5	55
<b>TOTAL CULTURAL COSTS</b>	<b>353</b>	<b>31</b>	<b>16</b>	<b>95</b>	<b>111</b>	<b>162</b>	<b>128</b>	<b>68</b>	<b>56</b>	<b>16</b>	<b>10</b>	<b>10</b>	<b>1,055</b>
Harvest:													
Pick Fruit									181	181			361
Haul To Shed									36	36			72
Pack Fruit									525	525			1,050
Sell @ 10% of Returns									214	214			428
<b>TOTAL HARVEST COSTS</b>									<b>0</b>	<b>955</b>	<b>955</b>	<b>0</b>	<b>0</b>
Interest on operating capital @ 7.65%	2	2	3	3	4	5	6	6	13	19	0	-0.13	62
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>355</b>	<b>33</b>	<b>18</b>	<b>98</b>	<b>115</b>	<b>167</b>	<b>134</b>	<b>74</b>	<b>1,024</b>	<b>990</b>	<b>10</b>	<b>10</b>	<b>3,028</b>
CASH OVERHEAD:													
Office Expense	5	5	5	5	5	5	5	5	5	5	5	5	65
Liability Insurance		6											6
Sanitation Fees		12											12
Property Taxes	32						32						65
Property Insurance	9						9						17
Investment Repairs	7	7	7	7	7	7	7	7	7	7	7	7	84
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>53</b>	<b>30</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>53</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>249</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>408</b>	<b>63</b>	<b>31</b>	<b>110</b>	<b>128</b>	<b>179</b>	<b>187</b>	<b>86</b>	<b>1,037</b>	<b>1,002</b>	<b>23</b>	<b>23</b>	<b>3,277</b>



UC COOPERATIVE EXTENSION  
**Table 6. RANGING ANALYSIS**  
 SAN JOAQUIN VALLEY – South 2005

COSTS PER ACRE AT VARYING YIELD TO PRODUCE POMEGRANATES

	YIELD (28 lb box/acre)							
	200	225	250	275	300	325	350	375
<b>OPERATING COSTS:</b>								
Cultural Cost	1,055	1,055	1,055	1,055	1,055	1,055	1,055	1,055
Harvest: Pick & Haul	289	325	361	397	433	469	505	541
Pack & Sell	985	1,108	1,231	1,354	1,478	1,601	1,724	1,847
Interest on operating capital	56	58	59	61	62	64	65	67
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>2,385</b>	<b>2,546</b>	<b>2,706</b>	<b>2,867</b>	<b>3,028</b>	<b>3,189</b>	<b>3,349</b>	<b>3,510</b>
Total Operating Costs/box	11.93	11.32	10.83	10.43	10.09	9.81	9.57	9.36
<b>CASH OVERHEAD COSTS/ACRE</b>								
<b>TOTAL CASH COSTS/ACRE</b>	<b>2,635</b>	<b>2,797</b>	<b>2,956</b>	<b>3,117</b>	<b>3,278</b>	<b>3,439</b>	<b>3,599</b>	<b>3,760</b>
Total Cash Costs/box	13.18	12.43	11.83	11.34	10.93	10.58	10.28	10.03
<b>NON-CASH OVERHEAD COSTS/ACRE</b>								
<b>TOTAL COSTS/ACRE</b>	<b>3,305</b>	<b>3,468</b>	<b>3,628</b>	<b>3,791</b>	<b>3,953</b>	<b>4,115</b>	<b>4,276</b>	<b>4,438</b>
Total Costs/box	16.53	15.42	14.51	13.79	13.18	12.66	12.22	11.84

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/box	YIELD (28 lb box/acre)							
	200	225	250	275	300	325	350	375
8.25	-735	-690	-644	-599	-553	-508	-462	-417
10.25	-335	-240	-144	-49	47	142	238	333
12.25	65	210	356	501	647	792	938	1,083
14.25	465	660	856	1,051	1,247	1,442	1,638	1,833
16.25	865	1,110	1,356	1,601	1,847	2,092	2,338	2,583
18.25	1,265	1,560	1,856	2,151	2,447	2,742	3,038	3,333
20.25	1,665	2,010	2,356	2,701	3,047	3,392	3,738	4,083

NET RETURNS PER ACRE ABOVE CASH COST

PRICE \$/box	YIELD (28 lb box/acre)							
	200	225	250	275	300	325	350	375
8.25	-985	-941	-894	-849	-803	-758	-712	-667
10.25	-585	-491	-394	-299	-203	-108	-12	83
12.25	-185	-41	106	251	397	542	688	833
14.25	215	409	606	801	997	1,192	1,388	1,583
16.25	615	859	1,106	1,351	1,597	1,842	2,088	2,333
18.25	1,015	1,309	1,606	1,901	2,197	2,492	2,788	3,083
20.25	1,415	1,759	2,106	2,451	2,797	3,142	3,488	3,833

NET RETURNS PER ACRE ABOVE TOTAL COST

PRICE \$/box	YIELD (28 lb box/acre)							
	200	225	250	275	300	325	350	375
8.25	-1,655	-1,612	-1,566	-1,523	-1,478	-1,434	-1,389	-1,345
10.25	-1,255	-1,162	-1,066	-973	-878	-784	-689	-595
12.25	-855	-712	-566	-423	-278	-134	11	155
14.25	-455	-262	-66	127	322	516	711	905
16.25	-55	188	434	677	922	1,166	1,411	1,655
18.25	345	638	934	1,227	1,522	1,816	2,111	2,405
20.25	745	1,088	1,434	1,777	2,122	2,466	2,811	3,155

UC COOPERATIVE EXTENSION  
**Table 7. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS**  
 SAN JOAQUIN VALLEY - South 2005

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
05	40 HP 2WD Tractor	14,263	15	2,777	1,350	59	85	1,494
05	80 HP MFWD Tractor	54,532	15	10,616	5,163	225	326	5,714
05	All Terrain Vehicle	5,790	7	2,196	776	28	40	844
05	Bin Trailers W/Bin #1	10,500	7	2,679	1,563	45	66	1,674
05	Bin Trailers W/Bin #2	10,500	7	2,679	1,563	45	66	1,674
05	Crowder - 13'	3,500	15	336	346	13	19	378
05	Duster - 3 point	5,000	10	884	613	20	29	662
05	Mower/Chopper - 8'	6,713	10	1,187	823	27	40	890
05	Orchard Sprayer 500 gal	19,741	10	3,491	2,419	80	116	2,615
05	Pickup Truck - 3/4 ton	32,000	7	12,139	4,289	152	221	4,662
05	Spot Sprayer ATV 20 gal	511	10	90	63	2	3	68
05	Weed Sprayer 100 G	3,424	10	606	419	14	20	453
<b>TOTAL</b>		<b>161,474</b>	<b>166,474</b>		<b>39,680</b>	<b>19,386</b>	<b>710</b>	<b>1,031</b>
60% of New Cost *		99,884		23,808	11,632	426	619	12,677

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

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insurance	Taxes	Repairs	
<b>INVESTMENT</b>								
Buildings 1,800 sqft	45,000	20		3,926	155	225	900	5,206
Orchard Establishment	31,520	22		2,620	109	158	630	3,516
Irrigation System	40,850	25		3,199	141	204	817	4,361
Fuel Tanks 2-250 gal	3,500	20	350	296	13	19	70	398
Land	375,000	25	375,000	22,538	0	3,750	0	26,288
Shop Tools	12,000	15	1,200	1,185	46	66	240	1,537
<b>TOTAL INVESTMENT</b>	<b>507,870</b>		<b>376,550</b>	<b>33,763</b>	<b>464</b>	<b>4,422</b>	<b>2,657</b>	<b>41,305</b>

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	95	acre	5.57	529
Office Expense	95	acre	65.00	6,175
Sanitation Fees	95	acre	12.37	1,175

UC COOPERATIVE EXTENSION  
**Table 8. HOURLY EQUIPMENT COSTS**  
 SAN JOAQUIN VALLEY - South 2005

		COSTS PER HOUR							
		Actual	Cash Overhead			Operating		Total	Total
Yr	Description	Hours Used	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Oper.	Costs/Hr.
05	40 HP 2WD Tractor	200	1.01	0.04	0.06	0.26	3.41	3.67	4.78
05	80 HP MFWD Tractor	800	3.87	0.17	0.24	2.35	6.82	9.17	13.45
05	All Terrain Vehicle	285	1.63	0.06	0.08	0.43	0.71	1.14	2.91
05	Bin Trailers W/Bin #1	382	2.46	0.07	0.10	1.57	0.00	1.57	4.20
05	Bin Trailers W/Bin #2	382	2.46	0.07	0.10	1.57	0.00	1.57	4.20
05	Crowder - 13'	133	1.56	0.06	0.09	0.93	0.00	0.93	2.64
05	Duster 3 point	200	1.84	0.06	0.09	0.85	0.00	0.85	2.84
05	Mower/Chopper - 8'	200	2.47	0.08	0.12	2.78	0.00	2.78	5.45
05	Orchard prayer 500 gal	200	7.25	0.24	0.35	3.35	0.00	3.35	11.19
05	Pickup Truck - 3/4 ton	285	9.03	0.32	0.46	2.35	5.21	7.56	17.37
05	Spot Sprayer ATV 20 gal	150	0.25	0.01	0.01	0.14	0.00	0.14	0.41
05	Weed Sprayer 100 G	150	1.68	0.06	0.08	0.92	0.00	0.92	2.74

UC COOPERATIVE EXTENSION  
**Table 9. POMEGRANATE OPERATIONS WITH EQUIPMENT**  
 SAN JOAQUIN VALLEY – South 2005

Operation	Operation		Field Labor Hr/Acre	Material	Broadcast Rate/acre	Unit
	Month	Tractor				
Weed: Dormant Strip	December	40HP 2WD	Weed Sprayer	Surflan	2.00	pt
				Goal	2.00	pt
Weed: Spray Middles 5X	February	40HP 2WD	Weed Sprayer	Roundup	1.00	pt
	April	40HP 2WD	Weed Sprayer	Roundup	1.00	pt
	June	40HP 2WD	Weed Sprayer	Roundup	1.00	pt
	July	40HP 2WD	Weed Sprayer	Roundup	1.00	pt
	September	40HP 2WD	Weed Sprayer	Roundup	1.00	pt
Weed: Spot Spray	May	ATV	ATV Sprayer	Roundup	0.10	pt
	July	ATV	ATV Sprayer	Roundup	0.10	pt
Weed: Furrow Middles	April	80HP MFWD	Crowder			
Insect: Aphid	April	80HP MFWD	Orchard Sprayer	Lannate	1.00	lb
Prune and Sucker: Hand	January			Labor	26.80	hrs
Sucker	June			Labor	4.50	hrs
Prune: Shred Brush	January	80HP MFWD	Mower/Chopper			
	June	80HP MFWD	Mower/Chopper			
Insect: Mites	May	40HP 2WD	Duster	Dusting Sulfur	50.00	lbs
	June	40HP 2WD	Duster	Dusting Sulfur	50.00	lbs
Insect: Worms	July	80HP MFWD	Orchard Sprayer	Dipel	2.00	lbs
Irrigate	April			Water	3.75	acin
	May			Water	3.75	acin
	June			Water	11.25	acin
	July			Water	11.25	acin
	August			Water	10.00	acin
	September			Water	5.00	acin
Fertilize: Nitrogen	May	40HP 2WD	Fert Co Spreader	Am Nitrate	100.00	lbs N
Harvest: Pick Fruit	Sept	40HP 2WD	Bin Trailers w/bins		14.77	
		80HP MFWD	Bin Trailers w/bins			
	August	40HP 2WD	Bin Trailers w/bins		14.77	
		80HP MFWD	Bin Trailers w/bins			
Harvest: Haul	Sept	Custom		6.5 bins	5.50	bin
	Oct	Custom		6.5 bins	5.50	bin
Pack Fruit	Sept	Custom		150 boxes	3.50	box
	Oct	Custom		150 boxes	3.50	box