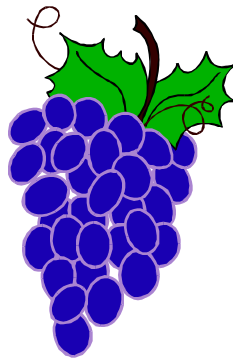

1997

UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

SAMPLE COSTS
TO ESTABLISH A VINEYARD AND PRODUCE
~*WINE GRAPES*~



SAN JOAQUIN VALLEY

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UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

INTRODUCTION

1997

SAMPLE COSTS TO ESTABLISH A VINEYARD AND PRODUCE WINE GRAPES San Joaquin Valley

The detailed costs for vineyard establishment and wine grape production in the San Joaquin Valley are presented in this study. The hypothetical farm used in this report consists of a total of 120 acres, 75 acres of wine grape producing acres, 40 acres are being established to grapes, and 5 acres are in farmstead, roads, and pumping stations.

The practices described in this cost study are considered typical for this crop and area. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to your situation. The use of trade names is not an endorsement or a recommendation. A blank *Your Cost* column is also provided to enter your actual costs on Table 2. Costs Per Acre To Produce Wine Grapes and Table 3. Costs And Returns Per Acre To Produce Wine Grapes. This study is only intended as a guide and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans.

This study consists of General Assumptions for Establishing a Vineyard and Producing Wine grapes and eight tables.

Table 1.	Sample Costs Per Acre To Establish A Wine Grape Vineyard
Table 2.	Costs Per Acre To Produce Wine Grapes
Table 3.	Costs And Returns Per Acre To Produce Wine Grapes
Table 4.	Monthly Cash Costs Per Acre To Produce Wine Grapes
Table 5.	Whole Farm Annual Equipment, Investment And Business Overhead Costs
Table 6.	Hourly Equipment Costs
Table 7.	Ranging Analysis
Table 8.	Costs And Returns/Breakeven Analysis

For an explanation of calculations used for the study refer to the attached General Assumptions, call the Department of Agricultural and Resource Economics, Cooperative Extension, University of California, Davis, California, (530) 752-3589 or call the San Joaquin Valley farm advisor in the county of choice.

This and other cost of production studies can be ordered from the Department of Agricultural and Resource Economics, U.C. Davis, or selected county Cooperative Extension offices.

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ASSUMPTIONS

1997

SAMPLE COSTS TO ESTABLISH A VINEYARD AND PRODUCE WINE GRAPES
San Joaquin Valley

The following is a description of the assumptions pertaining to Sample Costs to Establish a Vineyard and Produce Wine Grapes in the San Joaquin Valley. Practices described should not be considered recommendations by the University of California, but rather represent production procedures considered typical for this crop and area. Some of these costs and practices may not be applicable to your situation nor used during every production year. Additional ones not indicated may be needed. Establishment and cultural practices for the production of wine grapes vary by grower and region. Variations can be significant. The practices and inputs used in this cost study serve only as a sample or guide. These costs are represented on an annual, per acre basis. **The use of trade names in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products.**

Land. The wine grape vineyard is owned, managed, and operated by the grower. The vineyard is located in the San Joaquin Valley and is situated on previously farmed land. The vineyard is comprised of 120 acres, 75 of which are producing wine grapes, and 40 acres of wine grape grapes being established. The other 5 acres are occupied by roads, irrigation systems, and farmstead. Land is valued at \$10,500 per acre. This study assumes the land was purchased. Because only 115 of the 120 acres are planted to grapes, land is valued at \$10,957 per plantable acre.

Vines. Grape vines are planted on a 7' x 11' spacing with 565 vines per acre during the first spring. In the second year 25 vines per acre are replanted for those lost in the first year. Vines will be trained to up the stakes during the second and third years. The grapevines are expected to begin yielding fruit in three years and then be productive for an additional 22 years.

Trellis System. The trellis system is a vertical two-wire design and is installed by a custom trellis company in the second year. The trellis system is considered part of the vineyard since it would be removed at the time of vine removal and is shown in the vineyard establishment costs in Table 1. The following details the trellis system installation.

Once the vineyard is laid out and planted an eight-foot wooden end post is placed at each end of the rows. In between the end posts a seven-foot steel stake is driven into the ground at the site of every vine. Two 13 gauge wires are attached vertically to the stakes. The bottom wire supports the cordon and the top wire serves for foliar support.

Irrigation System. Since the vineyard is established on land previously planted to vineyards/orchards, it is assumed to have a well which will be refurbished and a new pump and motor will be installed prior to planting. The well, 40 hp motor, pump, filtration station, fertilizer tank and injector system, mainlines, valves, and the labor to renovate and install these components are included in the irrigation system cost. The irrigation system is considered an improvement to the property and has a 25 year life. Therefore, it is not found in preplant operations in Table 1, rather it is shown in the non-cash overhead sections as capital recovery cost of Tables 1-3 and the Investments portion of Table 5.

Water plus irrigator labor constitute the irrigation cost. In this study, water is calculated to cost \$5.63 per acre-inch or \$67.56 per acre-foot. The cost results from a mix of pumped and district water. The pumping cost is based on using 40 hp motor to pump from 130 feet deep over 120 acres. District water costs range from \$13 to \$46 per acre-foot or per acre. Price per acre-foot of water will vary by grower in this region depending on quantity used, water district, power cost, various well characteristics, and other irrigation factors.

Irrigations occur during the growing season from March through August and in production years includes a September postharvest irrigation. The drip irrigation lines are laid directly on the ground prior to planting. Nitrogen fertilizer is injected at the pump and flows into the drip line starting the first year. The amount of water applied to the vines varies through the establishment years and are shown in Table A.

Table A. Applied Irrigation Water

Year	Number of Months	AcIn/Year
1	7	8
2	7	18
3+	7	30

ESTABLISHMENT CULTURAL PRACTICES

This vineyard is established on ground that had previously been planted to vineyards or orchards. The land is assumed to be fairly level. The practices described below represents only the hypothetical vineyard in this study and may not be appropriate to your circumstance.

Site Preparation. The land subsoiled twice to a depth of 2-3 feet breaking up any underlying hardpan to improve root and water penetration. Afterwards the ground is disced twice to break up large clods of soil smoothing the ground in advance of leveling. Leveling consists of three passes with a landplane. The bare ground is fumigated, untarped, to control soil nematodes and pathogens. All of the land preparation operations are contracted out to commercial companies. Most operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year. All operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year in Table 1.

Planting. Planting the vineyard starts by laying out and marking vine sites in late winter. Holes are dug and vines are planted. Soon afterward a postplant, pre-emergent, residual herbicide is applied for weed control through most of the first year growing season. In the first year 25 vines per acre die and are replaced in the second year.

Training and Pruning. Training and pruning systems can vary depending on cultivar, rootstock, and soil type. Bilateral cordon training and spur pruning are most commonly practiced. Quadrilateral cordon training requires the addition of a crossarm.

Training is the selection of the main shoot and its upper laterals or branches that form the trunk and cordon. They are tied to the stake and cordon wire while unwanted shoots are removed, including any suckers arising from the rootstock. This is usually performed in the second year.

As the vines mature and grow larger, pruning costs increase and training costs decrease. Training continues only through the third year and requires a quarter of the labor-hours the second year needed. Suckering and retying require the majority of the time involved and continue throughout the life of the vineyard.

Insect and Arthropod Management. Insects and mites are managed by using integrated management techniques beginning the first year. Pest populations are monitored to determine when an economically damaging level will occur and which control method to use. From the third year on an insecticide is sprayed in May to manage omnivorous leaf roller (OLR), another treatment is made in July to control leafhoppers.

Disease Management. There are many pathogens that attack grapevines, but powdery mildew is the major disease treated for in this study. A dusting and spraying program for powdery mildew control begins the third year with two applications of sulfur dust and increases to four after the third year. Also in the third year, two wettable sulfur treatments are made with one mixed in the OLR spray. A sterol inhibitor is applied for additional mildew control in beginning in the third year. All applications are made using a 75 HP tractor and an air-blast sprayer.

Vineyard Floor Management. Weed control in the vine row and middles are managed with multiple discings, mowing, and herbicides. In the first year the row middles are disced twice and mowed twice from March through July. One discing is practiced in February to incorporate the shredded prunings and to prepare the soil for frost protection. The middles are then mowed four times from the late spring through fall. The vine rows are strip sprayed with different combinations of pre-emergent herbicides during winter each year. The sprayed strip amounts to only 30 percent of the total acreage.

Fertilization. A liquid nitrogen fertilizer is injected into the irrigation system beginning in the first year at five pounds of N per acre. The amount of nitrogen applied each year increases and is shown in Table B. The labor to set up and monitor the injection is included in the fertilization cost.

Table B. Applied Nitrogen Per Acre

Year	Pounds of N
1	5
2	10
3	20
4+	40

Establishment Cost. The establishment cost is the sum of the costs for land preparation, trellis system, planting, vines, cash overhead and production expenses for growing the vines through the first year that grapes are commercially harvested (year three). It is used to determine the non-cash overhead expense, capital recovery cost, during the production years. The total accumulated net cash cost in Table 1, in the third year represents the establishment cost. For this study the cost is \$4,105 per acre or \$307,875 for the 75 producing acres. The establishment cost is amortized over the remaining 22 years the vineyard is in production.

PRODUCTION CULTURAL PRACTICES

Pruning and Suckering. Pruning is done during the winter months and the prunings are shredded and disced in the row middles. Suckers are removed from the trunks each year.

Vineyard Floor Management. Herbicides and cultivation are used to manage the vineyard floor and control weeds. Four mowings are done in March through August. Vine row weeds are controlled with a pre-emergent herbicide mix applied as a strip spray during the winter. Escaped weeds are treated with a spot spray of a contact herbicide during the summer.

Fertilization. 40 pounds per acre of a liquid nitrogen fertilizer is injected into the drip irrigation system in five pound, weekly increments during May and June. Neutral zinc is applied to the foliage to prevent zinc deficiencies and is combined with the May mildew control spray.

Irrigation. Irrigation labor hours include servicing clock and filters, set-up and injection of chemicals (fertilizers and cleaning compounds), checking, replacing, and repairing drip lines and laterals.

Insect and Arthropod Management. Pest management techniques used to control insect and disease problems in the last year of vineyard establishment are the same practices used in the production years. OLR, leafhoppers, and mites are the three pests treated for at maturity in this study. OLR is treated for in May when the insecticide is combined with the May SI spray. Separate mite and leafhopper treatments are made in June.

Disease Management. Powdery mildew is treated beginning in April with two applications of wettable sulfur. The first wettable sulfur treatment is mixed with fixed copper. Four applications of sulfur dust are made in May and June. Two sterol inhibitor (SI) treatments are made; one in May and the second in June. The May SI spray is applied with the OLR control spray. Neutral zinc is also added during the bloom spray. All of the insect and fungicide sprays are made using a 75 HP tractor and orchard sprayer.

Pesticides, rates, and cultural practices mentioned in this cost study are a few of those listed in the publications *UC IPM Pest Management Guidelines, Grapes* and *Grape Pest Management*. 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. For additional production information contact one of the San Joaquin Valley viticulture farm advisors.

Harvest. Harvesting begins the third year. In this cost study, the vineyard contracts to have the grape crop custom harvested at a rate of \$45 per ton. Hauling the wine grapes to the processor is included in the \$45 per ton harvest cost.

Yields. Wine grapes begin bearing an economic crop in the third year after planting and reaches maturity in the fourth year. A yield of 6 ton per acre is used in the third year and 10 tons per acre in production years.

Prices. Prices per ton for wine grapes are determined by variety, quality, and materials other than grapes. A projected price of \$325 per ton of grapes is used in this study.

Risk. Risk is caused by various uncertainties including production, price, and financial. Examples of these are disease damage, decrease in price, and increase in interest rates. The risks associated with producing wine grapes in the San Joaquin Valley should not be underestimated.

While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent agronomic, market, and financial risks which affect the profitability and economic viability of wine grape production. Additionally, establishment of vineyards and the equipment required to properly handle the fruit is very capital intensive. Growers should consider all of the agronomic and economic risks before committing resources to establishment and production in this region.

Labor. Hourly wages for workers are \$6.50 and \$5.75 per hour for machine and non-machine workers, respectively. Adding 34% for Workers Compensation, Social Security, Medicare, insurance, and other possible benefits gives the labor rates shown of \$8.71 and \$7.71 per hour for machine labor and non-machine labor, respectively.

On September 1, 1997, the minimum wage increased from \$5.00 per hour to \$5.15 per hour and will be \$5.75 per hour by March 1, 1998. The wage rates for non-machine labor used in this study reflects the March 1, 1998 rate. Growers using wage rates different from those shown in this report may adjust their labor costs by subtracting or adding the appropriate amounts.

Labor time 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. Wages for a manager are not included as a cost. Returns 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, not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, and equipment repairs.

Property Taxes. Counties in California 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. The salvage value for land is equal to the purchase price because land does not depreciate from use.

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. The interest rate is from Production Credit Association in California.

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 \$526 for the entire farm.

Office Expense. Office and business expenses for 120 acres are estimated at \$4,500 annually or \$39 per planted acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

Non-cash Overhead. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Although farm equipment used on vineyards in the San Joaquin Valley may be purchased new or used, this study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and investments (Tables 1-3 and 5) equal 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.

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

Salvage Value: Salvage value is an estimate of the remaining market value of an investment at the end of its useful life. It is calculated differently for different investments. For farm machinery (i.e., tractors and implements) the remaining value is a percentage of the new cost of the investment. The calculation for the annual capital recovery costs is as follows.

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

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 United States Department of Agriculture - Economic Reporting Service's (USDA-ERS) 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 the 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 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 for a given operation to account for 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.

REFERENCES

American Society of Agricultural Engineers. (ASAE). 1994. *American Society of Agricultural Engineers Standards Yearbook*. St. Joseph, Missouri.

Boelje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, New York

Integrated Pest Management Education and Publications. 1997. *U.C. Pest management guidelines, Grapes*. In M. L. Flint (ed.) UC IPM pest management guidelines. University of California. Division of Agriculture and Natural Resources. Oakland, California. Publication 3339.

University of California Publications. 1992. *Grape Pest Management*. Second Edition. Division of Agriculture and Natural Resources. Oakland, California. Publication 3343.

U.C. COOPERATIVE EXTENSION

Table 1.

SAMPLE COSTS PER ACRE TO ESTABLISH A WINE GRAPE VINEYARD
SAN JOAQUIN VALLEY - 1997

Labor Rate: \$8.71/hr. machine labor
\$7.71/hr. non-machine labor

Vines Per Acre: 565
Interest Rate: 10%

Year	Cost Per Acre		
	1st	2nd	3rd
Tons Per Acre			6.0
Planting Costs:			
Land Preparation - Subsoil 2X	\$120		
Land Preparation - Disc 2X	\$50		
Land Preparation - Level	\$80		
Land Preparation - Fumigate	\$550		
Survey & Layout Vineyard	\$140		
Plant Vines: 565 Per Acre (2% Replant In 2nd Year)	\$394	18	
Install Trellis System		\$2,078	
TOTAL PLANTING COSTS	\$1,334	\$2,096	\$0
Cultural Costs:			
Prune - Dormant		\$46	97
Fertilize	\$8	8	16
Irrigate	\$84	140	207
Pest Control - Vertebrates	\$25	14	14
Training (Sucker, Tie & Train)		\$308	77
Weed Control - Disc Middle Year 1: 2X & Year 2+ 1X	\$14	7	7
Weed Control - Mow Middle Year 1: 2X & Year 2+: 4X	\$13	27	27
Weed Control - Hand Hoe	\$23		
Weed Control - Spot Spray			\$22
Insect Control - OLR		\$22	22
Insect Control - Leafhoppers			\$29
Disease Control - Dust Mildew 2X			\$24
Disease Control - Spray Mildew 2X (Wettable Sulfur & SI)			\$59
Weed Control - Winter Strip Spray	\$13	31	31
Miscellaneous Costs	\$48	48	48
Pickup Truck Use	\$34	34	34
TOTAL CULTURAL COSTS	\$262	\$685	\$714
Harvest Costs:			
Harvest - Contract			\$270
TOTAL HARVEST COSTS	\$0	\$0	\$270
Interest On Operating Capital @ 10%	\$62	\$133	\$32
TOTAL OPERATING COSTS/ACRE	\$1,658	\$2,914	\$1,016

U.C. COOPERATIVE EXTENSION

Table 1. Continued

Year	Cost Per Acre		
	1st	2nd	3rd
Tons Per Acre			6.0
Cash Overhead Costs:			
Office Expense	\$38	\$38	\$38
Liability Insurance	\$4	4	4
Sanitation Services	\$1	1	1
Property Taxes	\$53	53	55
Property Insurance	\$38	38	39
Investment Repairs	\$24	24	24
TOTAL CASH OVERHEAD COSTS	\$158	\$158	\$161
TOTAL CASH COSTS/ACRE	\$1,816	\$3,072	\$1,177
INCOME/ACRE FROM PRODUCTION	\$0	\$0	\$1,950
NET CASH COSTS/ACRE FOR THE YEAR	\$1,816	\$3,072	\$0
PROFIT/ACRE ABOVE CASH COSTS	\$0	\$0	\$773
ACCUMULATED NET CASH COSTS/ACRE	\$1,816	\$4,888	\$4,115
Non-Cash Overhead Costs (Capital Recovery):			
Land @ \$4,500	\$371	\$371	\$371
Furrow Irrigation System	\$94	94	94
Shop Building	\$13	13	13
Shop Tools	\$5	5	8
Fuel Tank & Pump	\$5	5	5
Equipment	\$51	24	75
TOTAL NON-CASH OVERHEAD COST	\$539	\$512	\$566
TOTAL COST/ACRE FOR THE YEAR	\$2,355	\$3,584	\$1,743
INCOME/ACRE FROM PRODUCTION	\$0	\$0	\$1,950
TOTAL NET COST/ACRE FOR THE YEAR	\$2,355	\$3,584	\$0
NET PROFIT/ACRE ABOVE TOTAL COST	\$0	\$0	\$207
TOTAL ACCUMULATED NET COST/ACRE	\$2,355	\$5,939	\$5,732

Table 2.

U.C. COOPERATIVE EXTENSION
 COSTS PER ACRE TO PRODUCE WINE GRAPE
 SAN JOAQUIN VALLEY - 1997

Labor Rate: \$8.71/hr. machine labor Interest Rate: 10.00%
 \$7.71/hr. non-machine labor Yield per Acre: 10.0 Ton

Operation	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Cultural:							
Prune & Tie	0.00	0	0	0	130	130	
Weed Control - Winter Strip	0.25	3	1	35	0	39	
Weed Control - Mow Middles 4X	1.72	18	10	0	0	28	
Weed Control - Disc Middles 1X	0.43	4	3	0	0	7	
Irrigate	5.00	39	0	169	0	207	
Pest Control - Vertebrate Pest	0.50	4	0	10	0	14	
Mildew Control - SI	1.15	12	7	37	0	56	
OLR & Mildew Control	0.38	4	2	15	0	21	
Mildew Control - Wettable Sulfur	0.38	4	2	2	0	8	
Fertilize	0.00	0	0	16	0	16	
Insect Control - Leafhopper	0.38	4	2	22	0	28	
Weed Control - Spot Spray	0.25	3	1	18	0	22	
Mildew Control - Dust Sulfur 4X	0.71	7	3	10	0	21	
Miscellaneous Costs	1.00	44	4	0	0	48	
Pickup Truck Use	2.38	25	9	0	0	34	
TOTAL CULTURAL COSTS	14.53	170	47	335	130	682	
Harvest:							
Harvest & Haul - Contract	0.00	0	0	0	450	450	
TOTAL HARVEST COSTS	0.00	0	0	0	450	450	
Interest on operating capital @ 10.00%						34	
TOTAL OPERATING COSTS/ACRE		170	47	335	580	1166	
CASH OVERHEAD:							
Office Expense						39	
Liability Insurance						5	
Property Taxes						89	
Property Insurance						64	
Investment Repairs						25	
TOTAL CASH OVERHEAD COSTS						221	
TOTAL CASH COSTS/ACRE						1387	

Table 2. Continued

NON-CASH OVERHEAD:			
Investment	Per producing Acre	-- Annual Cost -- Capital Recovery	Total Cost
-----	-----	-----	-----
Land	4696	387	387
Drip Irrigation System	1036	98	98
Buildings	150	13	13
Shop Tools	43	5	5
Fuel Tanks & Pump	52	5	5
Vineyard Establishment	6310	621	621
Equipment	590	77	77
-----	-----	-----	-----
TOTAL NON-CASH OVERHEAD COSTS	12877	1207	1207
-----			-----
TOTAL COSTS/ACRE			2593
=====			

Table 3.

U.C. COOPERATIVE EXTENSION
 COSTS AND RETURNS PER ACRE TO PRODUCE WINE GRAPE
 SAN JOAQUIN VALLEY - 1997

Labor Rate: \$8.71/hr. machine labor Interest Rate: 10.00%
 \$7.71/hr. non-machine labor

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
=====					
GROSS RETURNS					
Wine Grape	10.00	Ton	325.00	3250	
TOTAL GROSS RETURNS FOR WINE GRAPE				3250	

OPERATING COSTS					
Contract:					
Pruning	565.00	Vine	0.23	130	
Harvest & Haul	10.00	Ton	45.00	450	
Herbicide:					
Surflan	0.30	Gal	77.75	23	
Goal 1.6E	1.20	Pint	9.79	12	
Roundup	3.00	Pint	5.95	18	
Water:					
Irrigation	30.00	AcIn	5.63	169	
Rodenticide:					
Rodent Bait	5.00	Lb	2.05	10	
Fungicide:					
Kocide	4.00	Lb	2.24	9	
Rubigan EC	13.00	Oz	2.19	28	
Wettable Sulfur	6.00	Lb	0.56	3	
Dusting Sulfur	60.00	Lb	0.17	10	
Insecticide:					
Cryolite	5.00	Lb	2.68	13	
Provado	0.70	Oz	31.50	22	
Fertilizer:					
UN-32	40.00	Lb N	0.41	16	
Labor (machine)	10.84	Hrs	8.71	94	
Labor (non-machine)	9.80	Hrs	7.71	76	
Fuel - Gas	4.46	Gal	1.30	6	
Fuel - Diesel	18.59	Gal	0.97	18	
Lube				4	
Machinery repair				19	
Interest on operating capital @ 10.00%				34	
TOTAL OPERATING COSTS/ACRE				1166	

NET RETURNS ABOVE OPERATING COSTS				2084	

U.C. COOPERATIVE EXTENSION

Table 3. Continued

CASH OVERHEAD COSTS:	
Office Expense	39
Liability Insurance	5
Property Taxes	89
Property Insurance	64
Investment Repairs	25

TOTAL CASH OVERHEAD COSTS/ACRE	221

TOTAL CASH COSTS/ACRE	1387

NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY):	
Land	387
Drip Irrigation System	98
Buildings	13
Shop Tools	5
Fuel Tanks & Pump	5
Vineyard Establishment	621
Equipment	77

TOTAL NON-CASH OVERHEAD COSTS/ACRE	1207

TOTAL COSTS/ACRE	2593

NET RETURNS ABOVE TOTAL COSTS	657
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Table 4.

U.C. COOPERATIVE EXTENSION
 MONTHLY CASH COSTS PER ACRE TO PRODUCE WINE GRAPE
 SAN JOAQUIN VALLEY - 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:													
Prune & Tie	130												130
Weed Control - Winter Strip			39										39
Weed Control - Mow Middle 4X			7	7	7	7							28
Weed Control - Disc Middles			7										7
Irrigate			23	23	23	46	46	23	23				207
Pest Control - Vertebrate			14										14
Mildew Control - SI				24	15	17							56
OLR & Mildew Control				21									21
Mildew Control - Wetable Sulfur				8									8
Fertilize					8	8							16
Insect Control - Leafhopper						28							28
Weed Control - Spot Spray						22							22
Mildew Control - Dust Sulfur 4X						21							21
Miscellaneous Costs	4	4	4	4	4	4	4	4	4	4	4	4	48
Pickup Truck Use	3	3	3	3	3	3	3	3	3	3	3	3	34

TOTAL CULTURAL COSTS	137	7	97	90	60	157	53	30	30	7	7	7	682

Harvest:													
Harvest & Haul - Contract									450				450

TOTAL HARVEST COSTS									450				450

Interest on oper. capital	1	1	2	3	3	5	5	5	9	-0	-0	-0	34

TOTAL OPERATING COSTS/ACRE	138	8	99	93	64	161	58	35	489	7	7	7	1166

OVERHEAD:													
Office Expense	3	3	3	3	3	3	3	3	3	3	3	3	39
Liability Insurance	5												5
Property Taxes	45						45						89
Property Insurance	32						32						64
Investment Repairs	2	2	2	2	2	2	2	2	2	2	2	2	25

TOTAL CASH OVERHEAD COSTS	86	5	5	5	5	5	82	5	5	5	5	5	221

TOTAL CASH COSTS/ACRE	224	13	104	99	69	167	140	40	494	12	12	12	1387
=====													

Table 5.

U.C. COOPERATIVE EXTENSION
 WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
 SAN JOAQUIN VALLEY - 1997

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead -		Total
						Insur- ance	Taxes	
97	50 HP 2WD Tractor	29923	12	7481	3634	133	187	3954
97	75 HP 2WD Tractor	29953	12	7489	3637	133	187	3958
97	Disc - Offset 8'	9000	10	1592	1248	38	53	1339
97	Duster - 3 Pt	2520	16	214	282	10	14	306
97	Mower/Chopper - 8'	3672	10	649	509	15	22	546
97	Vineyard Sprayer - 500 Gal	17746	10	3138	2461	74	104	2639
97	Pickup Truck - 1/2 Ton	16226	7	6155	2459	80	112	2650
97	Weed Sprayer - 100 Gal	2339	10	414	324	10	14	348
TOTAL		111379		27132	14554	494	693	15740
60% of New Cost *		66827		16279	8732	296	416	9444

* 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	17200	30	1720	1550	67	95	344	2056
Drip Irrigation System	119150	25	11915	11244	467	655	2383	14750
Fuel Tanks & Pump	5985	25	599	565	23	33	60	681
Land	540000	25	540000	44550	3850	5400	0	53800
Shop Tools	5000	15	500	575	20	28	50	672
Vineyard Establishment	473225	23		46560	1687	2366	0	50613
TOTAL INVESTMENT	1160560		554734	105044	6115	8576	2837	122572

U.C. COOPERATIVE EXTENSION

Table 5. Continued

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	120.00	Acre	4.38	526
Office Expense	120.00	Acre	37.50	4500

Table 6.

UC COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
SAN JOAQUIN VALLEY - 1997

Yr Description	Actual Hours Used †	COSTS PER HOUR						Total Oper.	Total Costs/Hr.
		Capital Recovery	Cash Over- head Insur- ance	Taxes	Repairs	Operating Fuel & Lube			
97 50 HP 2WD Tractor	1017.0	2.14	0.08	0.11	1.27	2.74	4.01	6.34	
97 75 HP 2WD Tractor	189.1	11.54	0.42	0.59	0.55	3.01	3.56	16.12	
97 Disc - Offset 8'	199.3	3.76	0.11	0.16	1.42	0.00	1.42	5.45	
97 Duster - 3 Pt	135.6	1.25	0.04	0.06	0.38	0.00	0.38	1.74	
97 Mower/Chopper - 8'	200.0	1.53	0.05	0.06	1.69	0.00	1.69	3.32	
97 Vineyard Sprayer - 500 Gal	171.9	8.59	0.26	0.36	2.16	0.00	2.16	11.37	
97 Pickup Truck - 1/2 Ton	273.1	5.40	0.18	0.25	1.18	2.80	3.98	9.80	
97 Weed Sprayer - 100 Gal	119.5	1.63	0.05	0.07	0.58	0.00	0.58	2.32	

† Actual hours used equals the combined hours equipment is used for wine grapes and other farm enterprises.

Table 7.

U.C. COOPERATIVE EXTENSION
RANGING ANALYSIS
SAN JOAQUIN VALLEY - 1997

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE WINE GRAPES

	YIELD (TON/ACRE)						
	7.00	8.00	9.00	10.00	11.00	12.00	13.00
<hr/>							
OPERATING COSTS/ACRE:							
Cultural Cost	682	682	682	682	682	682	682
Harvest Cost	315	360	405	450	495	540	585
Interest on operating capital	33	33	34	34	34	35	35
TOTAL OPERATING COSTS/ACRE	1029	1075	1120	1166	1211	1256	1302
TOTAL OPERATING COSTS/TON	147	134	124	117	110	105	100
CASH OVERHEAD COSTS/ACRE	221	221	221	221	221	221	221
TOTAL CASH COSTS/ACRE	1251	1296	1341	1387	1432	1478	1523
TOTAL CASH COSTS/TON	179	162	149	139	130	123	117
NON-CASH OVERHEAD COSTS/ACRE	1207	1207	1207	1207	1207	1207	1207
TOTAL COSTS/ACRE	2457	2503	2548	2593	2639	2684	2730
TOTAL COSTS/TON	351	313	283	259	240	224	210

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR WINE GRAPE

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
	7.00	8.00	9.00	10.00	11.00	12.00	13.00
Wine Grapes							
150.00	21	125	230	334	439	544	648
200.00	371	525	680	834	989	1144	1298
250.00	721	925	1130	1334	1539	1744	1948
300.00	1071	1325	1580	1834	2089	2344	2598
350.00	1421	1725	2030	2334	2639	2944	3248
400.00	1771	2125	2480	2834	3189	3544	3898
450.00	2121	2525	2930	3334	3739	4144	4548

U.C. COOPERATIVE EXTENSION

Table 7. Continued

NET RETURNS PER ACRE ABOVE CASH COSTS FOR WINE GRAPE

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
	7.00	8.00	9.00	10.00	11.00	12.00	13.00
Wine Grapes							
150.00	-201	-96	9	113	218	322	427
200.00	149	304	459	613	768	922	1077
250.00	499	704	909	1113	1318	1522	1727
300.00	849	1104	1359	1613	1868	2122	2377
350.00	1199	1504	1809	2113	2418	2722	3027
400.00	1549	1904	2259	2613	2968	3322	3677
450.00	1899	2304	2709	3113	3518	3922	4327

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR WINE GRAPE

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
	7.00	8.00	9.00	10.00	11.00	12.00	13.00
Wine Grapes							
150.00	-1407	-1303	-1198	-1093	-989	-884	-780
200.00	-1057	-903	-748	-593	-439	-284	-130
250.00	-707	-503	-298	-93	111	316	520
300.00	-357	-103	152	407	661	916	1170
350.00	-7	297	602	907	1211	1516	1820
400.00	343	697	1052	1407	1761	2116	2470
450.00	693	1097	1502	1907	2311	2716	3120

Table 8.

UC COOPERATIVE EXTENSION
 COSTS AND RETURNS / BREAKEVEN ANALYSIS
 SAN JOAQUIN VALLEY - 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)
Wine Grapes	3250	1166	2084	1387	1863	2593	657

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)
Wine Grapes	243750	87422	156328	104013	139737	194506	49244

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	----- Breakeven Price To Cover -----		
			Operating Costs	Cash Costs	Total Costs
Wine Grapes	10.0	Ton	116.56	138.68	259.34

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price (\$/Unit)	----- Breakeven Yield To Cover -----		
			Operating Costs	Cash Costs	Total Costs
Wine Grapes	Ton	325.00	3.6	4.3	8.0