

UC COOPERATIVE EXTENSION

SAMPLE COSTS TO ESTABLISH AND PRODUCE WINE GRAPES San Joaquin Valley - 2005

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INTRODUCTION

Sample costs to establish and produce wine grapes 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. Practices described are considered typical for the crop and area, but these practices will not apply to every farming operation. The sample costs for labor, materials, equipment and custom services are based on current figures. A blank column, “*Your Costs*”, in Tables 2 and 3 is provided for entering 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 8 and pertain to sample costs to establish the vineyard and produce wine grapes in the San Joaquin Valley. The cultural practices described represent production operations and materials considered typical on a well-managed vineyard in the region. Costs, materials, and practices in this study will not apply to all farms. Timing of and types of establishment and cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, and insect and disease pressure. The study does not represent a single farm and is intended as a guide only. **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 hypothetical vineyard, owned and operated by the grower, is located on previously farmed land in the San Joaquin Valley. The farm is comprised of 120 acres, 40 acres of wine grapes being established and 75 acres of raisin grapes. Roads, irrigation systems, and farmstead occupy the remaining five acres.

Establishment Operating Costs (Table 1)

Site Preparation. This vineyard is established on ground previously planted to vineyards or orchards. Land coming from vines or trees should be fallowed for two years except for possible grain crops. The land is assumed to be fairly level. A custom operator chisels (subsoil) the ground twice to a depth of 4 to 5 feet. The grower floats the land to smooth and level the surface. Afterwards the ground is disced twice to apply and incorporate preplant herbicide. Nematode samples should be taken from land formerly in vines or trees and fumigated if necessary. Most operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year.

Trellis System. A commercial company installs the trellis system in December of the first year or January of the second year (January in this report). The trellis system is a vertical two-wire design. Trellis materials include 1.25 lb x 7-ft T-posts, 4 lb x 9.5-ft rail end posts, 1/4 x 40-inch rod, 12.5 gauge fruit and catch wires. Also a 14-gauge wire is strung at 24-inches to hold the drip tubing.

Planting. Planting starts by laying out and marking vine sites in late winter. In the spring, holes are dug and the vines are planted and protected with an open carton placed over the vine. The vines are planted on a 7-ft x 11-ft (vine x row) spacing at 565 vines per acre. In the second year 2% or 11 vines per acre are replanted for those lost in the first year.

Vines. No specific variety is planted in this study, but the data refers to spur pruned varieties, such as white varieties - French Colombard, Chenin Blanc - and red varieties – Rubired, Ruby Cabernet, Barbera. The vines in this report are purchased as dormant vines that have been bench grafted or field budded onto nematode/phylloxera resistant rootstock. The life of the vineyard at planting is expected to be 25 years and the grapevines are expected to begin yielding fruit in three years.

Training/Pruning. Training and pruning to establish the vine framework will vary with variety and trellis system. Training includes tying, shoot thinning, shoot positioning and pruning. Bilateral cordon training and spur pruning 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. Quadrilateral cordon training requires the addition of crossarms. Dormant pruning

begins in January of the second year. The young vines are pruned back to a 2-bud spur. Shoot thinning is done twice a month in April and May, shoot thinning and cordon training twice a month in June and July. In the third year, shoot thinning and shoot positioning are done in April and May, respectively. For more information on trellis and training systems please refer to *Wine Grape Varieties in California*, UC publication 3419.

Irrigation. In this study, the water is assumed to cost \$5.67 per acre-inch or \$68.00 per acre-foot. Water costs plus labor constitute the irrigation cost. Water costs vary considerably among districts and the water cost in this report represents a cost within that range. Irrigations occur during the growing season from March through September. No assumption is made about effective rainfall or runoff. The amount of water applied to the vines during the establishment years is shown in Table A. The drip irrigation system is described under Non-Cash Overhead.

Table A. Applied Irrigation Water

Year	AcIn/Year
1	8
2	18
3+	30

Pest Management. The pesticides and rates mentioned in this cost study as well as other materials available are listed in *UC Integrated Pest Management Guidelines, Grapes*. Pesticides mentioned in the study are commonly used, but other materials may be available.

Insects. Beginning in the third year, Kryocide insecticide is applied in early May at bloom (combined with Rubigan and zinc) to control worms (grape leaffolder, omnivorous leafroller, western grapeleaf skeletonizer). Provado insecticide is applied in July to control leafhoppers. Additionally, insects such as mealybugs should be monitored each year and may add additional costs if found. If mealybugs are found during vineyard establishment, the grower should consult with a PCA, farm advisor, and/or Ag commissioner to develop management strategies.

Diseases. The major disease treated in this study is powdery mildew. A dusting and spraying program for these diseases begins the third year with a wettable sulfur application soon after budbreak in late March or early April. Dusting sulfur is applied twice in April and once in June. A sterol inhibitor (SI) - Rubigan in this study - is applied in May during early bloom (combined with worm and zinc spray) and once in June, two weeks after bloom.

Weeds. Treflan herbicide is applied and incorporated during land preparation in the fall of the first year prior to planting. Vineyard floor management begins in late winter, February of the second year, with a strip spray in the vine row with Roundup, Surflan, and Goal. In the first year, the middles are mowed twice and disced twice. In the second and subsequent years, the row middles are disced in April and mowed in March, May, June, and August. The vine rows are spot treated with Roundup in late April and late July or early August.

Fertilization. Liquid nitrogen fertilizer - UN32, containing 32% nitrogen (N) - is applied in equal amounts through the drip system in May and June. Five pounds of N is applied in the first year, 10 in the second year, and 20 in the third year. Zinc as neutral zinc is applied with the bloom spray (Kryocide and Rubigan).

Harvest. Harvest begins the third year. The crop is mechanically harvested by a custom harvest operator and hauled to the processor by a custom hauler.

Yields. The average vineyard yields are six-tons per acre in the third year and 10-tons in the fourth.

Returns. In this study, the grapes are sold to a winery for which the grower receives \$200 per ton, the current estimated market price

Production Years Operating Costs

Pruning. Pruning is done during the winter months – December and/or January. The vines are mechanically hedged or box pruned, followed with hand pruning to touch-up and clean the vines. The prunings are mechanically raked from the vine row, then shredded during the first mowing and incorporated into the soil with the April discing. Canopy skirting (mechanical) is done with the grower's equipment in June and in July.

Trellis/Vines. Trellis repairs are done annually (January in this study) and the cost is not taken from any specific data. Weak or missing vines are replaced by layering. One year-old canes from neighboring vines are buried (layered) in the soil next to the stake and allowed to root. After rooting, the canes are cut and the plant is trained on the trellis. Trellis repair and vine replacement increases with vineyard age.

Fertilization. Forty pounds per acre of nitrogen (N) as UN32 is divided and applied through the drip lines in equal amounts in May and June. Neutral zinc at five pounds of material per acre is applied in May with the disease and insect application.

Irrigation. Water costs plus labor, which includes checking the drip lines, constitute the irrigation cost. Irrigation labor includes servicing the clock and filters, set-up and injection of chemicals, checking, replacing, and repairing drip lines and laterals. In this study, water is calculated to cost \$5.67 per acre-inch or \$68.00 per acre-foot. Water costs vary considerably among districts and the water cost in this report represents a cost within that range. Thirty acre-inches are applied during the growing season from April through late September. No assumption is made about effective rainfall and runoff. Deficit irrigation may be used in mature vineyards in the San Joaquin Valley, but is not addressed in this study.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Grapes*. For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. Information and pesticide use permits are available through 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, many other pesticides are available. Adjuvants are recommended for use with many pesticides for effective control, but the adjuvants and their costs are not included. Pesticide costs may vary by location, brand, and grower volume. Pesticide costs in this study are from a single dealer and shown as full retail.

Pest Control Adviser (PCA). Written recommendations are required for many commercially applied pesticides and are made by licensed pest control advisers. In addition, the PCA can 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. No costs for a PCA are included in this report.

Weeds. Surflan, Goal and Roundup herbicides are applied as a winter strip spray to the vine row in February. Vine row weeds that germinate during the growing season are controlled with two Roundup spot sprays – April, July. The row middles are mowed four times – March for frost control and to shred prunings, May, June, and August prior to harvest. The middles are also disced in April for weed control and to incorporate the vine prunings.

Insects. Vine Mealybug (*Pseudococcus sp.*) is treated with Lorsban insecticide in late February to early March (dormant vines). Western grapeleaf skeletonizer (*Harrisina brillians*) is treated at bloom with Kryocide in late April or early May (combined with powdery mildew and foliar fertilizer spray). Provado insecticide is applied in July to control grape leafhoppers (*Erythroneura elegantula*). The materials are applied with the

grower's equipment. Growers with heavy mealybug infestations may apply split applications of Admire insecticide through the drip line around bloom to fruit set (mid-May) and then again 21-45 days later on light to medium textured soils. See the UC IPM guidelines for alternative management strategies if heavier soils are involved. A calculated cost for the split Admire applications is \$130 per acre. It may be necessary to use multiple insecticides to control some mealybug species. Wineries may have restrictions on the use of some insecticides, so growers should consult with their winery prior to application.

Diseases. The major disease considered in this study is powdery mildew (*Uncinula necator*). Wettable sulfur is applied soon after budbreak in late March or early April. A second application is made in April. Dusting sulfur is applied once in April, in May, and in June. A sterol inhibitor, Rubigan, is applied in May at early bloom (with the worm and zinc spray) and a strobilurin fungicide, Flint, in June two weeks after bloom. Mildew is controlled during the season with various fungicide applications at 7 to 21 day intervals, depending on the fungicide used. Growers have the option of using sterol inhibitors (SI), quinolins, strobilurins, or sulfur (micronized, wettable, dust, flowable), as well as other fungicides to control powdery mildew. These materials are classes of fungicides with different modes of action. Check the IPM website under grapes for management options to control powdery mildew. It is recommended that applicators use fungicides with different modes of action in order to avoid fungicide resistance in powdery mildew populations. Growers should consult with wineries to determine cut-off dates for fungicide restrictions.

Harvest. A custom operator mechanically harvests the crop. Harvest costs in this report are \$225 per acre, which is a mid-range of costs provided by the growers. A commercial trucker hauls the grapes to the processor for \$10 per ton. Hauling costs will vary depending upon the hauling distance.

Yields. An average yield of 12-tons per acre is assumed over the remaining life of the vineyard.

Returns. The market price in this report, based on *2003 Final Grape Crush Report*, CDFR Agricultural Statistics Branch, depending on variety ranges from \$124 to \$270 per ton. An average of \$200 per ton for both white and red varieties is used in this report to show a range of returns over various yields (Table 5).

Pickup/ATV. It is assumed that the grower uses the pickup for business and personal use. Estimated business mileage for the ranch is 3,300 miles. The all terrain vehicle (ATV) is used for spot spraying weeds and is included in that cost. It is assumed that the ATV will be used another two-hours per acre for checking the vineyards including the irrigation system.

Labor. Labor rates of \$12.73 per hour for machine operators and \$11.05 for general labor includes payroll overhead of 34%. The basic hourly wages are \$9.50 for machine operators and \$8.25 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for vineyards (code 0040), 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, 2004 (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.

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 Agriculture 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 \$1.50 and \$1.95 per gallon, respectively. The fuel prices are averaged based on two California delivery locations. The cost includes a 2% sales tax 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 Table 2 is determined by multiplying the total hourly operating cost in Table 7 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. The risks associated with crop production 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 profitability and economic viability. Growers may purchase Federal crop insurance to reduce the production risk associated with specific natural hazards. Insurance policies vary and range from a basic catastrophic loss policy to one that insures losses for up to 75% of a crop. Crop insurance is not included in this report, but insurance costs will depend on the type and level of coverage.

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 \$661 per year for the entire farm.

Office Expense. Office and business expenses for 120 acres are estimated at \$75 per producing acre or \$8,625 annually for the farm. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc. The cost is assumed and not taken from any specific data.

Sanitation Services. Sanitation services provide double portable toilets with washbasins for 10 months. The cost includes delivery and weekly cleaning service. The number of sanitation facilities and length of time the service is required will vary depending upon local regulations and size of labor force. In many cases labor contractors furnish the sanitation facilities for their crews and the cost is included in the contractor's labor overhead.

Management/Supervisor Wages. Salary is not included. Returns above costs are considered a return to management.

Investment Repairs. Annual maintenance is calculated as 2% of the purchase price.

Non-Cash Overhead Costs

Non-cash overhead is calculated as the annual capital recovery cost for ownership of 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 Table 6.

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. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Establishment Cost. Costs to establish the vineyard are used to determine capital recovery expenses on investment for the production years. 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 harvested minus any returns from production. The Total Accumulated Net Cash Cost on Table 1, in the third year represents the establishment cost. For this study the cost is \$7,104 per acre or \$284,160 for the 40-acre vineyard. The establishment cost is spread over the remaining 22 years of the 25 years the vineyard is in production.

Irrigation System. The previous vineyard is assumed to have an irrigation system that has been refurbished. The drip line is laid on the ground prior to planting. After the trellis system is installed, the drip line is clipped to the bottom trellis wire. The system includes the installation labor, filters, fertilizer injector, time clock, and valves. Although the materials will have a useful life equivalent to the vineyard, the irrigation system can be included in the vineyard establishment costs or as in this case an improvement to the property with a 25-year life.

Land. The land was formerly a vineyard, but has been out of production for two years. The open land was planted to grain crops. Land in the San Joaquin Valley for grape production ranges from \$4,500 to \$6,500 per acre (CA Association of Farm Manager and Real Estate Appraisers). For this report, a land value of \$5,800 per acre or \$6,052 per producing acre is used (five of the 120 acres are not planted). It is assumed the grower originally purchased the land with an established vineyard. The annual cost of land is interest only since land does not depreciate.

Building. The metal buildings are on a cement slab and comprise 2,400 square feet.

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 Table 6. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in a previous section. 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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UC COOPERATIVE EXTENSION
Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A VINEYARD
 SAN JOAQUIN VALLEY - 2005

	Cost Per Acre			
	Year:	1st	2nd	3rd
	Tons Per Acre:	0.0	0.0	6.0
Planting Costs:				
Land Prep: Chisel 2X (Custom)		300		
Land Prep: Level (Float)		7		
Land Prep: Disc/Apply Herbicide (Treflan) 1st pass		12		
Land Prep: Disc (Incorporate Herbicide) 2nd pass		7		
Plant: Survey & Layout Vineyard		76		
Plant: Dig, Plant, Place Vines Guards		170	2	
Vines: 565 Per Acre (2% Replant In 2nd Year)		1,497	29	
Install Trellis System			3,000	
TOTAL PLANTING COSTS		2,069	3,031	0
Cultural Costs:				
Prune: Dormant			55	133
Prune/Training: (Sucker, Tie & Train)			442	110
Fertilize: applied through drip line (UN32)		3	5	9
Irrigate: (water & labor)		79	132	204
Weed: Winter Strip-vine row- Spray (Goal, Surflan, Roundup)			79	79
Weed: Disc Middles Yr 1, 2X. Yr 2+, 1X.		14	7	7
Weed: Spot Spray (Roundup) 2X.			28	28
Weed: Mow Middles Yr 1 2X. Yr 2+ 4X.		16	25	25
Weed: Hand Hoe		33		
Insect: Leafhoppers (Provado)				54
Disease: Mildew (Wettable Sulfur) 2X				44
Disease: Mildew (Dusting Sulfur) 3X				26
Disease: Mildew (Flint)				46
Insect: Worms (Kryocide,). Disease: Mildew (Rubigan). Fertilize: (Zn)				54
Pickup: Business Use		41	41	41
ATV: General Use		33	33	33
TOTAL CULTURAL COSTS		219	847	893
Harvest Costs:				
Harvest: (Machine) & Haul				285
TOTAL HARVEST COSTS		0	0	285
Interest On Operating Capital		102	201	26
TOTAL OPERATING COSTS/ACRE		2,390	4,079	1,204
Cash Overhead Costs:				
Office Expense		75	75	75
Liability Insurance		6	6	6
Sanitation Services		20	20	20
Property Taxes		70	70	71
Property Insurance		6	7	8
Investment Repairs		32	32	32
TOTAL CASH OVERHEAD COSTS		209	210	212
TOTAL CASH COSTS/ACRE		2,599	4,289	1,416
INCOME/ACRE FROM PRODUCTION		0	0	1,200
NET CASH COSTS/ACRE FOR THE YEAR		2,599	4,289	216
PROFIT/ACRE ABOVE CASH COSTS		0	0	0
ACCUMULATED NET CASH COSTS/ACRE		2,599	6,888	7,104

UC COOPERATIVE EXTENSION
Table 1. continued

	Cost Per Acre			
	Year:	1st	2nd	3rd
	Tons Per Acre:	0	0	6.0
Capital Recovery Cost:				
Land		364	364	364
Drip Irrigation System		74	74	74
Shop Building		46	46	46
Shop Tools		10	10	10
Fuel Tank & Pump		2	2	2
Equipment		25	26	60
TOTAL CAPITAL RECOVERY COST		521	522	556
TOTAL COST/ACRE FOR THE YEAR		3,120	4,811	1,972
INCOME/ACRE FROM PRODUCTION		0	0	1,200
TOTAL NET COST/ACRE FOR THE YEAR		3,120	4,811	772
NET PROFIT/ACRE ABOVE TOTAL COST		0	0	0
TOTAL ACCUMULATED NET COST/ACRE		3,120	7,931	8,703

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE TO PRODUCE WINE GRAPES
 SAN JOAQUIN VALLEY - 2005

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre				Total Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	
Cultural:						
Vines: Layering Missing Vines	1.00	11	0	0	0	11
Trellis: Repair	2.00	22	0	10	0	32
Prune: (mechanical)	0.00	0	0	0	85	85
Prune: Clean Up Vines (hand prune)	4.00	44	0	0	0	44
Prune: Rake Prunings (mechanical)	0.23	4	2	0	0	5
Weed: Winter Strip Spray (Roundup, Goal, Surflan)	0.54	8	4	67	0	79
Irrigate: (water & labor)	3.05	34	0	170	0	204
Weed: Mow 4X	0.94	14	8	0	0	22
Insect: Mealybug (Lorsban)	0.83	13	8	27	0	49
Weed: Spot Spray 20% acres 2X (Roundup)	1.15	18	2	9	0	28
Weed: Disc	0.31	5	2	0	0	7
Disease: Mildew (Wettable Sulfur)	1.67	25	17	1	0	44
Disease: Mildew (Dusting Sulfur)	0.92	14	7	5	0	26
Fertilize: through drip (UN32)	0.10	1	0	16	0	17
Insect: Skeletonizer (Kryocide). Disease: Mildew (Rubigan). Fertilizer: (Zn)	0.83	13	8	33	0	54
Prune: Skirt Vines (mechanical)	0.50	8	4	0	0	11
Disease: Mildew (Flint)	0.83	13	8	25	0	46
Insect: Leaf Hopper (Provado)	0.83	13	8	33	0	54
Pickup: Business use for vineyard	1.50	23	18	0	0	41
ATV: Miscellaneous vineyard use	2.00	31	2	0	0	33
TOTAL CULTURAL COSTS	23.24	312	100	396	85	893
Harvest:						
Harvest: Machine Harvest & Haul	0.00	0	0	0	345	345
TOTAL HARVEST COSTS	0.00	0	0	0	345	345
Interest on operating capital						28
TOTAL OPERATING COSTS/ACRE		312	100	396	430	1,265
Cash Overhead:						
Office Expense						75
Liability Insurance						6
Sanitation						20
Property Taxes						107
Property Insurance						32
Investment Repairs						174
TOTAL CASH OVERHEAD COSTS						415
TOTAL CASH COSTS/ACRE						1,680
Non-Cash Overhead:						
		Per producing Acre		Annual Cost Capital Recovery		
Land		6,052		364		364
Drip Irrigation System		950		74		74
Buildings		522		46		46
Tools-Shop/Field		104		10		10
Fuel Tanks		30		2		2
Vineyard Establishment		7,104		590		590
Equipment		496		67		67
TOTAL NON-CASH OVERHEAD COSTS		15,259		1,153		1,153
TOTAL COSTS/ACRE						2,834

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS to PRODUCE WINE GRAPES
 SAN JOAQUIN VALLEY - 2005

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Wine Grapes	12.00	Ton	200.00	2,400	
OPERATING COSTS					
Trellis System:					
Trellis Materials	1.00	acre	10.00	10	
Custom:					
Prune Mechanical	1.00	acre	85.00	85	
Machine Harvest	1.00	acre	225.00	225	
Haul to Crusher	12.00	ton	10.00	120	
Herbicide:					
Roundup Ultra Max	1.66	pint	8.56	14	
Goal 2XL	1.00	pint	16.21	16	
Surflan 4 AS	2.64	pint	16.96	45	
Irrigation:					
Water	30.00	acin	5.67	170	
Fungicide:					
Wettable Sulfur	6.00	lb	0.21	1	
Dusting Sulfur	30.00	lb	0.18	5	
Rubigan EC	4.00	froz	2.50	10	
Flint	1.50	oz	16.49	25	
Fertilizer:					
UN 32	40.00	lb N	0.41	16	
Neutral Zinc 50%	5.00	lb	0.92	5	
Insecticide:					
Lorsban 4E	4.00	pint	6.86	27	
Kryocide	6.00	lb	3.00	18	
Provado 1.6 Solupak	0.75	oz	43.96	33	
Labor (machine)	15.71	hrs	12.73	200	
Labor (non-machine)	10.15	hrs	11.05	112	
Fuel - Gas	7.93	gal	1.95	15	
Fuel - Diesel	27.34	gal	1.50	41	
Lube				8	
Machinery repair				35	
Interest on operating capital @ 7.65%				28	
TOTAL OPERATING COSTS/ACRE				1,265	
NET RETURNS ABOVE OPERATING COSTS				1,135	
Cash Overhead:					
Office Expense				75	
Liability Insurance				6	
Sanitation				20	
Property Taxes				107	
Property Insurance				32	
Investment Repairs				174	
TOTAL NON-CASH OVERHEAD COSTS				415	
TOTAL COSTS/ACRE				1,680	
Non-Cash Overhead:					
Land				364	
Drip Irrigation System				74	
Buildings				46	
Tools-Shop/Field				10	
Fuel Tanks				2	
Vineyard Establishment				590	
Equipment				67	
TOTAL NON-CASH OVERHEAD COSTS				1,153	
TOTAL COSTS/ACRE				2,834	
NET RETURNS ABOVE TOTAL COSTS				-434	

UC COOPERATIVE EXTENSION
Table 4. MONTHLY CASH to PRODUCE WINE GRAPES
 SAN JOAQUIN VALLEY - 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:													
Vines: Layering Missing Vines	11												11
Trellis: Repair	32												32
Prune (mechanical)	85												85
Prune: Clean Up Vines (hand prune)	44												44
Prune: Rake Prunings (mechanical)	5												5
Weed: Winter Strip Spray (Roundup, Goal, Surflan)		79											79
Irrigate: (water & labor)			11	15	22	46	52	32	26				204
Weed: Mow 4X (March includes shred prunings)			8		5	5		5					22
Insect: Mealybug, (Lorsban)			49										49
Weed: Spot Spray 20% acres (Roundup)				14			14						28
Weed: Disc				7									7
Disease: Mildew (Wettable Sulfur)				44									44
Disease: Mildew (Dusting Sulfur)				9	9	9							26
Fertilize: through drip (UN32)					9	9							17
Insect: Worms (Kryocide). Disease: Mildew (Rubigan). Fertilizer: (Zn)					54								54
Prune: Skirt Vines						6	6						11
Disease: Mildew (Flint)						46							46
Insect: Leaf Hopper (Provado)								54					54
Pickup: Business use for vineyard	3	3	3	3	3	3	3	3	3	3	3	3	41
ATV 4WD: Miscellaneous vineyard use	3	3	3	3	3	3	3	3	3	3	3	3	33
TOTAL CULTURAL COSTS	184	85	74	94	104	126	132	43	32	6	6	6	893
Harvest:													
Harvest: Machine Harvest & Haul								345					345
TOTAL HARVEST COSTS								345					345
Interest on operating capital @ 7.65%	1	2	2	3	3	4	5	8	0	0	0	0	28
TOTAL OPERATING COSTS/ACRE	185	87	76	97	108	131	137	395	32	6	6	6	1,265
Cash Overhead:													
Office Expense	6	6	6	6	6	6	6	6	6	6	6	6	75
Liability Insurance	6												6
Sanitation	2	2	2	2	2	2	2	2	2				20
Property Taxes	54							54					107
Property Insurance	16							16					32
Investment Repairs	15	15	15	15	15	15	15	15	15	15	15	15	174
TOTAL CASH OVERHEAD COSTS/ACRE	99	23	23	23	23	23	93	23	23	21	21	21	415
TOTAL CASH COSTS/ACRE	284	110	99	120	131	154	230	418	55	27	27	27	1,680

UC COOPERATIVE EXTENSION
Table 5. RANGING ANALYSIS
 SAN JOAQUIN VALLEY - 2005

COSTS PER ACRE AT VARYING YIELD TO PRODUCE WINE GRAPES

	YIELD (ton/acre)						
	8.00	9.00	10.00	11.00	12.00	13.00	14.00
OPERATING COSTS:							
Cultural Cost	893	893	893	893	893	893	893
Harvest Cost	305	315	325	335	345	355	365
Interest on operating capital	27	27	28	28	28	28	28
<i>TOTAL OPERATING COSTS/ACRE</i>	1,225	1,235	1,246	1,256	1,266	1,276	1,286
<i>Total Operating Costs/ton</i>	153	137	125	114	106	98	92
CASH OVERHEAD COSTS/ACRE							
<i>TOTAL CASH COSTS/ACRE</i>	1,640	1,650	1,661	1,671	1,681	1,691	1,701
<i>Total Cash Costs/ton</i>	205	183	166	152	140	130	122
NON-CASH OVERHEAD COSTS/ACRE							
<i>TOTAL COSTS/ACRE</i>	2,793	2,803	2,814	2,824	2,834	2,844	2,854
<i>Total Costs/ton</i>	349	311	281	257	236	219	204

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE	YIELD (ton/acre)						
	8.00	9.00	10.00	11.00	12.00	13.00	14.00
\$/ton							
100.00	-425	-335	-246	-156	-66	24	114
125.00	-225	-110	4	119	234	349	464
150.00	-25	115	254	394	534	674	814
175.00	175	340	504	669	834	999	1,164
200.00	375	565	754	944	1,134	1,324	1,514
225.00	575	790	1,004	1,219	1,434	1,649	1,864
250.00	775	1,015	1,254	1,494	1,734	1,974	2,214

NET RETURNS PER ACRE ABOVE CASH COST

PRICE	YIELD (ton/acre)						
	8.00	9.00	10.00	11.00	12.00	13.00	14.00
\$/ton							
100.00	-840	-750	-661	-571	-481	-391	-301
125.00	-640	-525	-411	-296	-181	-66	49
150.00	-440	-300	-161	-21	119	259	399
175.00	-240	-75	89	254	419	584	749
200.00	-40	150	339	529	719	909	1,099
225.00	160	375	589	804	1,019	1,234	1,449
250.00	360	600	839	1,079	1,319	1,559	1,799

NET RETURNS PER ACRE ABOVE TOTAL COST

PRICE	YIELD (ton/acre)						
	8.00	9.00	10.00	11.00	12.00	13.00	14.00
\$/ton							
100.00	-1,993	-1,903	-1,814	-1,724	-1,634	-1,544	-1,454
125.00	-1,793	-1,678	-1,564	-1,449	-1,334	-1,219	-1,104
150.00	-1,593	-1,453	-1,314	-1,174	-1,034	-894	-754
175.00	-1,393	-1,228	-1,064	-899	-734	-569	-404
200.00	-1,193	-1,003	-814	-624	-434	-244	-54
225.00	-993	-778	-564	-349	-134	81	296
250.00	-793	-553	-314	-74	166	406	646

UC COOPERATIVE EXTENSION
Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
 SAN JOAQUIN VALLEY - 2005

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
05	60HP 4WD Narrow Tractor	36,000	15	7,009	3,408	149	215	3,772
05	ATV 4WD	6,700	5	3,003	1,058	34	49	1,140
05	Brush Rake	6,500	10	1,149	796	27	38	861
05	Brush Shredder 6 ft	9,000	15	864	890	34	49	974
05	Cane Cutter	2,500	20	130	215	9	13	237
05	Disc - Tandem 8 ft	6,800	10	1,203	833	28	40	901
05	Duster - 3 Pt	5,000	5	1,629	898	23	33	954
05	Mower-Rotary 6 ft	2,050	10	363	251	8	12	272
05	Vine Sprayer 500 gal	20,378	5	6,638	3,662	94	135	3,890
05	Pickup Truck 1/2 Ton	26,000	7	9,863	3,484	124	179	3,788
05	Sprayer ATV 20 gal	350	10	62	43	1	2	46
05	Weed Sprayer 3PT 100 gal	3,500	10	619	429	14	21	464
TOTAL		124,778		32,532	15,968	545	787	17,300
60% of New Cost *		74,867		19,519	9,581	327	472	10,380

* 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	
Building 2,400 sqft	60,000	20		5,235	208	300	1,200	6,943
Drip Irrigation System	38,000	25		2,975	132	190	760	4,057
Vineyard Establishment	284,160	22		23,619	985	1,421	5,683	31,707
Fuel Tanks 2-250 gal	3,500	30	350	250	13	19	70	353
Land	696,000	25	696,000	41,830	0	6,960	0	48,790
Tools: Shop/Field	12,000	15	1,133	1,188	46	66	240	1,539
TOTAL INVESTMENT	1,093,660		697,483	75,097	1,383	8,956	7,953	93,389

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	115	acre	5.74	660
Office Expense	115	acre	75.00	8,625
Sanitation Fee	115	acre	20.43	2,349

UC COOPERATIVE EXTENSION
Table 7. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY - 2005

Yr Description	COSTS PER HOUR							Total Costs/Hr.
	Actual Hours Used	Capital Recovery	Cash Overhead		Operating		Total Oper.	
			Insur- ance	Taxes	Repairs	Fuel & Lube		
05 60HP 4WD Narrow Tractor	1,066	1.96	0.08	0.12	.89	5.08	5.97	8.09
05 ATV 4WD	400	1.59	0.05	0.07	0.50	0.75	1.25	2.96
05 Brush Rake	250	1.91	0.06	0.09	0.91	0.00	0.91	2.98
05 Brush Shredder 6 ft	131	4.03	0.15	0.22	4.04	0.00	4.06	8.47
05 Cane Cutter	100	1.29	0.05	0.08	0.95	0.00	0.95	2.38
05 Disc - Tandem 8 ft	200	2.51	0.08	0.12	1.10	0.00	1.10	3.81
05 Duster - 3 Pt	240	2.25	0.06	0.08	0.73	0.00	0.73	3.12
05 Mower-Rotary 6 ft	200	0.75	0.03	0.04	0.98	0.00	0.98	1.79
05 Vine Sprayer 500 gal	401	5.49	0.14	0.20	3.59	0.00	3.59	9.42
05 Pickup Truck 1/2 Ton	285	7.34	0.26	0.38	1.91	10.28	12.19	20.16
05 Sprayer ATV 20 gal	150	0.17	0.01	0.01	0.10	0.00	0.10	0.28
05 Weed Sprayer 3PT 100 gal	200	1.28	0.04	0.06	0.61	0.00	0.61	1.99

UC COOPERATIVE EXTENSION
Table 8. OPERATIONS WITH EQUIPMENT
 SAN JOAQUIN VALLEY - WINE GRAPES 2005

Operation	Operation Month	Tractor	Implement	Material	Broadcast Rate/acre	Unit
Cultural:						
Vines: Layer vines	January			Labor	1.00	hrs
Trellis: Repair	January			Labor	2.00	hrs
				Materials	10.00	ac
Prune (mechanical)	January	Custom				
Prune: Clean up vines (hand prune)	January			Labor	4.00	hrs
Prune: Rake Prunings (mechanical)	January	60HP 4WD	Brush Rake			
Prune: Skirt Vines (mechanical)	June	60HP 4WD	Cane Cutter			
	July	60HP 4WD	Cane Cutter			
Weed: Winter Strip	February	60HP 4WD	Weed Sprayer 3 Pt	Roundup	0.66	pt
				Goal	1.00	pt
				Surflan	2.64	pt
Weed: Mow	March	60HP 4WD	Shredder			
	May	60HP 4WD	Mower - Rotary			
	June	60HP 4WD	Mower - Rotary			
	August	60HP 4WD	Mower - Rotary			
Weed: Spot Spray	April	ATV	ATV Sprayer	Roundup	0.50	pt
	July	ATV	ATV Sprayer	Roundup	0.50	pt
Weed: Disc	April	60HP 4WD	Disc - Tandem			
Irrigate:	March			Water	1.00	acin
	April			Water	2.00	acin
	May			Water	3.00	acin
	June			Water	7.00	acin
	July			Water	8.00	acin
	August			Water	5.00	acin
	September			Water	4.00	acin
Disease: Mildew	April	60HP 4WD	Vine Sprayer	Wettable Sulfur	3.00	lb
	April	60HP 4WD	Vine Sprayer	Wettable Sulfur	3.00	lb
	April	60HP 4WD	Duster	Dusting Sulfur	10.00	lb
	May	60HP 4WD	Duster	Dusting Sulfur	10.00	lb
	June	60HP 4WD	Vine Sprayer	Flint	1.50	oz
	June	60HP 4WD	Duster	Dusting Sulfur	10.00	lb
Insect. Disease. Fertilize	May	60HP 4WD	Vine Sprayer	Kryocide (Skeletonizer)	6.00	lb N
				Rubigan (Mildew)	4.00	floz
				Neutral Zinc	5.00	lb
Insect: Mealybug	March	60HP 4WD	Vine Sprayer	Lorsban	6.00	pint
Insect: Leafhopper	July			Provado	0.75	oz
Fertilize: through drip	May			UN32	20.00	lb N
	June			UN32	20.00	lb N
Harvest: Machine Pick and Haul	August	Custom				