
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2004

**SAMPLE COSTS TO ESTABLISH
AND PRODUCE
GRAPES FOR CONCENTRATE
SPUR PRUNED VARIETIES**



SAN JOAQUIN VALLEY - South

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UC COOPERATIVE EXTENSION

SAMPLE COSTS TO ESTABLISH AND PRODUCE GRAPES FOR CONCENTRATE (Spur Pruned Varieties) San Joaquin Valley – South 2004

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INTRODUCTION

Sample costs to establish a vineyard and produce grapes – spur pruned varieties - for concentrate are presented in this study. The information in the report is derived from interviews with growers who produce grapes mainly for wine and raisins with concentrate as an option. Wine production that goes to concentrate is often decided by the winery, whereas raisin growers often have until some time around the end of June to make the decision to convert from raisins to concentrate. At that point, the growers will modify the remaining cultural practices such as irrigation, pest and disease control, and harvest. Practices described are compiled from grower interviews based on what-if scenarios for concentrate production. California does not have varieties available for planting that are bred specifically for concentrate production, but uses white and red varieties grown for wine and raisin production. For concentrate production, growers should consider the varieties that are adaptable to mechanical pruning and mechanical harvest to reduce labor costs. Cane pruned varieties such as Thompson Seedless appear to not be readily adaptable to mechanical pruning and therefore are not considered in this report.

The study is intended as a guide only and can be used to make production decisions, determine potential returns, prepare budget, and evaluate production loans. The hypothetical farm operation, production practices, overhead and calculations are described under the assumptions. For additional information, contact the Department of Agricultural and Resource Economics at 530-752-3589.

Sample Cost of Production Studies are available for many commodities and can be downloaded from the department website <http://coststudies.ucdavis.edu> or requested by calling 530-752-1517.

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ASSUMPTIONS

The assumptions refer to Tables 1 to 7 and pertain to sample costs to establish the vineyard and produce spur pruned grape varieties for concentrate in the San Joaquin Valley. The cultural practices described are based on grower interviews, and represent suggested production operations and materials to be considered when establishing a vineyard and producing grapes specifically for concentrate. 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 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 concentrate grapes being established and 75 acres of raisin grapes. Roads, irrigation systems, and farmstead occupy the remaining five acres.

Establishment Operating Costs (Table 1)

Establishment Notes. Vineyard establishment costs and operations do not significantly differ from those vineyards established for wine, raisin, or table grapes. The typical variations are in variety, canopy management (pruning and training), plant spacing, and the trellis system. Although some growers are harvesting in the second year, in this report, it is assumed a more typical harvest is in the third year.

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 a possible grain crop. The land is assumed to be fairly level. A custom operator chisels the ground (subsoils) twice to a depth of 4-5 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 rods, 12.5 gauge fruit and catch wires. Also a 14-gauge wire is strung at 24-inches above ground 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 the red varieties – Rubired, Royalty, Salvador. 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 to establish the vine framework 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 is done in April and shoot positioning in May.

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 are not recommendations.

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.

Diseases. The major diseases treated in this study are powdery mildew, and phomopsis cane and leaf spot. 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 early August.

Fertilization. Liquid nitrogen fertilizer – UN32 - 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 vineyard yields approximately six-tons of fresh grapes per acre.

Returns. In this study, the fresh fruit is sold to a concentrate processor 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.

Cane Pruned Varieties. Thompson Seedless, one of the top varieties used for concentrate, and Fiesta, a new variety are both cane pruned and not taken into account in this report.

Trellis/Vines. Trellis repairs are done annually and the cost is not taken from any specific data. For various reasons such as trellis type, age, and mechanical damage, the repair costs will vary from year to year. Repair labor hours are estimated and are not a representative sample of grower costs. The repair materials are assumed to be included in Investment Repairs under Cash Overhead Costs. Cuttings are made early in the season and planted in March to replace sick vines.

Fertilization. Forty pounds per acre of nitrogen (N) as UN-32 is divided and applied 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 also 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.

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 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 pesticides and are made by licensed pest control advisers. In addition the PCA will monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCA’s or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. No costs for a PCA are included in this report.

Weeds. The row middles are mowed four times – March for frost control and to shred prunings, May, June, and August prior to harvest. The row middles are also disced in April to incorporate the vine prunings. Vine row weeds are controlled with three Roundup spot sprays – April, June, July.

Insects. Kryocide insecticide for worm control (grape leaffolder, omnivorous leafroller, western grapeleaf skeletonizer) is applied in early May at bloom with the powdery mildew and foliar fertilizer spray. Provado insecticide is applied in July to control leafhoppers.

Diseases. The major diseases considered in this report are powdery mildew, and Phomopsis cane and leaf spot. 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.

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 trucking 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 25-year life of the vineyard, beginning in the fourth year.

Returns. The market price in this report, based on grower inputs for 2004, is \$200 per acre for both white and red varieties. A range of returns over various yields are shown in 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 \$1.45 and \$1.88 per gallon, respectively. The fuel prices are averaged based on four California delivery locations plus \$0.24 per gallon, which is one-half the difference between the high and low price for regular gasoline in 2003 from the California State Automobile Association Monthly Survey. The cost includes a 2.25% sales tax (effective September 2001) on diesel fuel and 7.25% sales tax on gasoline. Gasoline also includes federal and state excise tax, which can be refunded for on-farm use when filing your income tax. The fuel, lube, and repair cost per acre for each operation in 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 6.89% 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 0.676% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$645 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 ranch. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc. The cost is assumed and not taken from any specific data.

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

Investment Repairs. Annual maintenance on investments (Non-Cash Overhead) are calculated as 2% of the purchase price for the irrigation system, building, tools, fuel tanks and establishment costs.

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 5.

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 6.25% 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 \$7,096 per acre or \$283,840 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 Tables 3 and 8. 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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Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A VINEYARD
 SAN JOAQUIN VALLEY - 2004

	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, Wrap Vines	170	2		
Vines: 565 Per Acre (2% Replant In 2nd Year)	1,497	29		
Install Drip System (See Drip System in Non-Cash Overhead)				
Install Trellis System		3,000		
TOTAL PLANTING COSTS	2,069	3,031		
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)		79	79	
Weed: Disc Middles Yr 1, 2X. Yr 2+, 1X.	14	7	7	
Weed: Spot Spray (Roundup) 3X.		42	42	
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	861	907	
Harvest Costs:				
Harvest: (Machine) & Haul				285
TOTAL HARVEST COSTS	0	0		285
Interest On Operating Capital @ 6.89	92	182	23	
TOTAL OPERATING COSTS/ACRE	2,380	4,074	1,215	
Cash Overhead Costs:				
Office Expense	75	75	75	
Liability Insurance	6	6	6	
Sanitation Services	19	19	19	
Property Taxes	70	70	72	
Property Insurance	6	6	7	
Investment Repairs	32	32	32	
TOTAL CASH OVERHEAD COSTS	208	208	211	
TOTAL CASH COSTS/ACRE	2,588	4,282	1,426	
INCOME/ACRE FROM PRODUCTION	0	0	1,200	
NET CASH COSTS/ACRE FOR THE YEAR	2,588	4,282	226	
PROFIT/ACRE ABOVE CASH COSTS	0	0	0	
ACCUMULATED NET CASH COSTS/ACRE	2,588	6,870	7,096	

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Table 1. continued

	Cost Per Acre			
	Year:	1st	2nd	3rd
	Tons Per Acre:	0	0	6.0
Capital Recovery Cost:				
Land		377	377	377
Drip Irrigation System		76	76	76
Shop Building		46	46	46
Shop Tools		10	10	10
Fuel Tank & Pump		2	2	2
Equipment		25	28	62
TOTAL CAPITAL RECOVERY COST		536	539	573
TOTAL COST/ACRE FOR THE YEAR		3,124	4,821	1,999
INCOME/ACRE FROM PRODUCTION		0	0	1,200
TOTAL NET COST/ACRE FOR THE YEAR		3,124	4,821	799
NET PROFIT/ACRE ABOVE TOTAL COST		0	0	0
TOTAL ACCUMULATED NET COST/ACRE		3,124	7,945	8,744

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Table 2. COSTS PER ACRE TO PRODUCE GRAPES FOR CONCENTRATE – Spur Pruned Varieties
 SAN JOAQUIN VALLEY - 2004

Operation	Cash and Labor Cost per acre					
	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost
Cultural:						
Prune (mechanical)	0.00	0	0	0	85	85
Hand Prune/Clean Up Vines	2.00	22	0	0	0	22
Prune: Rake Prunings (mechanical)	0.23	4	2	0	0	5
Trellis: Repair (labor only, see text)	2.00	22	0	0	0	22
Weed: Winter Strip Spray (Roundup, Goal, Surflan)	0.54	8	4	67	0	79
Vines: Plant cuttings	1.00	11	0	0	0	11
Irrigate: (water & labor)	3.05	34	0	170	0	204
Weed: Mow 4X (includes shred prunings)	0.96	15	10	0	0	25
Weed: Spot Spray 20% acres 3X (Roundup)	1.73	26	2	13	0	42
Weed: Disc	0.31	5	2	0	0	7
Disease: Mildew (Wettable Sulfur)	1.67	25	17	1	0	43
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/Rake Prunings (mechanical)	0.63	10	5	0	0	15
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 4WD: Miscellaneous vineyard use	2.00	31	2	0	0	33
TOTAL CULTURAL COSTS	21.13	288	94	363	85	830
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 @ 6.89%						22
TOTAL OPERATING COSTS/ACRE		288	94	363	430	1,197
Cash Overhead:						
Office Expense						75
Liability Insurance						6
Sanitation						19
Property Taxes						107
Property Insurance						32
Investment Repairs						174
TOTAL CASH OVERHEAD COSTS						412
TOTAL CASH COSTS/ACRE						1,609
Non-Cash Overhead:						
		Per producing Acre		Annual Cost Capital Recovery		
Land		6,052		377		377
Drip Irrigation System		950		76		76
Buildings		522		46		46
Tools-Shop/Field		104		10		10
Fuel Tanks		30		2		2
Vineyard Establishment		7,096		601		601
Equipment		499		66		66
TOTAL NON-CASH OVERHEAD COSTS		15,253		1,179		1,179
TOTAL COSTS/ACRE						2,789

UC COOPERATIVE EXTENSION

Table 3. COSTS AND RETURNS to PRODUCE GRAPES FOR CONCENTRATE – Spur Pruned Varieties
SAN JOAQUIN VALLEY - 2004

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Grapes for Concentrate	12.00	ton	200.00	2,400	
OPERATING COSTS					
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	2.16	pint	8.56	18	
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	floz	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:					
Kryocide	6.00	lb	3.00	18	
Provado 1.6 Solupak	0.75	oz	43.96	33	
Labor (machine)	15.58	hrs	12.73	198	
Labor (non-machine)	8.15	hrs	11.05	90	
Fuel - Gas	8.13	gal	1.88	15	
Fuel - Diesel	25.11	gal	1.45	36	
Lube				8	
Machinery repair				34	
Interest on operating capital @ 6.89%				22	
TOTAL OPERATING COSTS/ACRE				1,197	
NET RETURNS ABOVE OPERATING COSTS				1,203	
Cash Overhead:					
Office Expense				75	
Liability Insurance				6	
Sanitation				19	
Property Taxes				107	
Property Insurance				32	
Investment Repairs				174	
TOTAL NON-CASH OVERHEAD COSTS				412	
TOTAL COSTS/ACRE				1,609	
Non-Cash Overhead:					
Land				377	
Drip Irrigation System				76	
Buildings				46	
Tools-Shop/Field				10	
Fuel Tanks				2	
Vineyard Establishment				601	
Equipment				66	
TOTAL NON-CASH OVERHEAD COSTS				1,179	
TOTAL COSTS/ACRE				2,789	
NET RETURNS ABOVE TOTAL COSTS				-389	

UC COOPERATIVE EXTENSION

Table 4. MONTHLY CASH to PRODUCE GRAPES FOR CONCENTRATE – Spur Pruned Varieties
SAN JOAQUIN VALLEY - 2004

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Beginning JAN 04	04	04	04	04	04	04	04	04	04	04	04	04	
Ending DEC 04													
Cultural:													
Prune (mechanical)	85												85
Hand Prune/Clean Up Vines	22												22
Prune: Rake Prunings (mechanical)	5												5
Trellis: Repair (labor only, see text)	22												22
Weed: Winter Strip Spray (Roundup, Goal, Surflan)		79											79
Vines: Plant cuttings for missing vines			11										11
Irrigate: (water & labor)			11	15	22	46	52	32	26				204
Weed: Mow 4X (includes shred prunings)			6		6	6		6					25
Weed: Spot Spray 20% acres (Roundup)				14		14	14						42
Weed: Disc				7									7
Disease: Mildew (Wettable Sulfur)				43									43
Disease: Mildew (Dusting Sulfur)				9	9	9							26
Fertilize: through drip (UN32)					9	9							17
Insect: Skeletonizer (Kryocide). Disease: Mildew (Rubigan). Fertilizer: (Zn)					54								54
Prune: Cut Canes/Rake Prunings (mechanical)						7	7						15
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	141	85	35	94	105	143	133	44	32	6	6	6	830
Harvest:													
Harvest: Machine Harvest & Haul								345					345
TOTAL HARVEST COSTS								345					345
Interest on operating capital	1	1	1	2	3	3	4	6	0	0	0	0	22
TOTAL OPERATING COSTS/ACRE	141	86	36	96	108	146	138	395	32	6	6	6	1,197
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				19
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	98	23	23	23	23	23	92	23	23	21	21	21	412
TOTAL CASH COSTS/ACRE	239	109	59	119	131	169	230	418	55	27	27	27	1,609

UC COOPERATIVE EXTENSION
Table 5. RANGING ANALYSIS
 SAN JOAQUIN VALLEY - 2004

COSTS PER ACRE AT VARYING YIELD TO PRODUCE GRAPES FOR CONCENTRATE – Spur Pruned Varieties

	YIELD (ton/acre)						
	9.00	10.00	11.00	12.00	13.00	14.00	15.00
OPERATING COSTS:							
Cultural Cost	830	830	830	830	830	830	830
Harvest Cost	315	325	335	345	355	365	375
Interest on operating capital	22	22	22	22	22	22	22
<i>TOTAL OPERATING COSTS/ACRE</i>	1,167	1,177	1,187	1,197	1,207	1,217	1,227
<i>Total Operating Costs/ton</i>	130	118	108	100	93	87	82
CASH OVERHEAD COSTS/ACRE							
<i>TOTAL CASH COSTS/ACRE</i>	1,579	1,589	1,599	1,609	1,619	1,629	1,639
<i>Total Cash Costs/ton</i>	175	159	145	134	125	116	109
NON-CASH OVERHEAD COSTS/ACRE							
<i>TOTAL COSTS/ACRE</i>	2,758	2,768	2,778	2,788	2,798	2,808	2,818
<i>Total Costs/ton</i>	306	277	253	232	215	201	188

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE	YIELD (ton/acre)						
	9.00	10.00	11.00	12.00	13.00	14.00	15.00
\$/ton	93	223	353	483	613	743	873
140.00	93	223	353	483	613	743	873
160.00	273	423	573	723	873	1,023	1,173
180.00	453	623	793	963	1,133	1,303	1,473
200.00	633	823	1,013	1,203	1,393	1,583	1,773
220.00	813	1,023	1,233	1,443	1,653	1,863	2,073
240.00	993	1,223	1,453	1,683	1,913	2,143	2,373
260.00	1,173	1,423	1,673	1,923	2,173	2,423	2,673

NET RETURN PER ACRE ABOVE CASH COST

PRICE	YIELD (ton/acre)						
	9.00	10.00	11.00	12.00	13.00	14.00	15.00
\$/ton	-319	-189	-59	71	201	331	461
140.00	-319	-189	-59	71	201	331	461
160.00	-139	11	161	311	461	611	761
180.00	41	211	381	551	721	891	1,061
200.00	221	411	601	791	981	1,171	1,361
220.00	401	611	821	1,031	1,241	1,451	1,661
240.00	581	811	1,041	1,271	1,501	1,731	1,961
260.00	761	1,011	1,261	1,511	1,761	2,011	2,261

NET RETURNS PER ACRE ABOVE TOTAL COST

PRICE	YIELD (ton/acre)						
	9.00	10.00	11.00	12.00	13.00	14.00	15.00
\$/ton	-1,498	-1,368	-1,238	-1,108	-978	-848	-718
140.00	-1,498	-1,368	-1,238	-1,108	-978	-848	-718
160.00	-1,318	-1,168	-1,018	-868	-718	-568	-418
180.00	-1,138	-968	-798	-628	-458	-288	-118
200.00	-958	-768	-578	-388	-198	-8	182
220.00	-778	-568	-358	-148	62	272	482
240.00	-598	-368	-138	92	322	552	782
260.00	-418	-168	82	332	582	832	1,082

UC COOPERATIVE EXTENSION
Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
 SAN JOAQUIN VALLEY - 2004

ANNUAL EQUIPMENT COSTS

Yr Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes		
04 60HP 4WD Narrow Tractor	36,000	15	7,009	3,467	145	215		3,827
04 ATV 4WD	6,700	5	3,003	1,070	33	49		1,152
04 Brush Rake	6,500	10	1,149	807	26	38		871
04 Cane Cutter	2,500	20	130	219	9	13		241
04 Disc - Tandem 8'	6,800	10	1,203	844	27	40		911
04 Duster - 3 Pt	5,000	5	1,629	907	22	33		962
04 Mower-Flail 8'	9,600	15	922	964	36	53		1,053
04 Orch/Vine Sprayer 500 gal	20,378	5	6,638	3,696	91	135		3,922
04 Pickup Truck 1/2 Ton	26,000	7	9,863	3,529	121	179		3,829
04 Sprayer ATV 20 gal	350	10	62	43	1	2		47
04 Weed Spray 3PT 100 gal	3,500	10	619	434	14	21		469
TOTAL	123,328		32,227	15,979	526	778		17,283
60% of New Cost *	73,997		19,336	9,588	315	467		10,370

* 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		5,329	203	300	1,200	7,032
Drip Irrigation System	38,000	25		3,038	128	190	760	4,116
Vineyard Establishment	283,840	22		24,045	959	1,419	5,677	32,101
Fuel Tanks 2-300 gal	3,500	30	350	256	13	19	70	359
Land	696,000	25	696,000	43,361	0	6,960	0	50,321
Tools: Shop/Field	12,000	15	1,133	1,206	44	66	240	1,556
TOTAL INVESTMENT	1,093,340		697,483	77,236	1,348	8,954	7,947	95,485

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	115	acre	5.60	644
Office Expense	115	acre	75.00	8,625
Sanitation Fee	115	acre	18.96	2,180

UC COOPERATIVE EXTENSION
Table 7. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY - 2004

Yr Description	COSTS PER HOUR								
	Actual Hours Used	Capital Recovery	Cash Overhead			Operating		Total Oper.	Total Costs/Hr.
			Insur- ance	Taxes	Repairs	Fuel & Lube			
04 60HP 4WD NarrowTractor	1,066.10	1.95	0.08	0.12	0.88	4.91	5.79	7.95	
04 ATV 4WD	400.20	1.60	0.05	0.07	0.50	0.72	1.22	2.94	
04 Brush Rake	250.40	1.93	0.06	0.09	0.91	0.00	0.91	2.99	
04 Cane Cutter	100.00	1.31	0.05	0.08	0.95	0.00	0.95	2.39	
04 Disc - Tandem 8'	199.50	2.54	0.08	0.12	1.10	0.00	1.10	3.84	
04 Duster - 3 Pt	239.70	2.27	0.06	0.08	0.73	0.00	0.73	3.13	
04 Mower-Flail 8'	133.40	4.34	0.16	0.24	4.31	0.00	4.31	9.04	
04 Orch/Vine Sprayer 500 gal	400.60	5.54	0.14	0.20	3.58	0.00	3.58	9.46	
04 Pickup Truck 1/2 Ton	285.00	7.43	0.26	0.38	1.91	9.91	11.82	19.88	
04 Sprayer ATV 20 gal	150.20	0.17	0.01	0.01	0.10	0.00	0.10	0.28	
04 Weed Spray 3PT 100 gal	200.40	1.30	0.04	0.06	0.61	0.00	0.61	2.01	