
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2001

SAMPLE COSTS
TO ESTABLISH A VINEYARD AND PRODUCE
WINE GRAPES

Cabernet Sauvignon



San Joaquin Valley North

THE LODI APPELLATION

of San Joaquin and Sacramento Counties

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**SAMPLE COST TO ESTABLISH A VINEYARD
AND PRODUCE WINE GRAPES
Cabernet Sauvignon – Drip Irrigation
San Joaquin Valley North, Lodi Appellation of
San Joaquin and Sacramento Counties – 2001**

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INTRODUCTION

Sample costs to establish a vineyard and produce wine grapes under drip irrigation in the northern San Joaquin Valley – Lodi Appellation of Sacramento and San Joaquin counties are presented in this study. This study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on production practices considered typical for the crop and area, but these same practices will not apply to every situation. 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 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 are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-1515. Current studies can be downloaded from the department website at <http://coststudies.ucdavis.edu> or obtained from selected county UC Cooperative Extension offices.

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ASSUMPTIONS

The assumptions refer to Tables 1 to 7 and pertain to sample costs to establish a vineyard and produce wine grapes in the Lodi Appellation of the northern San Joaquin Valley – Sacramento and San Joaquin counties. For district location and other related information see the website <http://www.lodiwine.com>. Practices described are not University of California recommendations, but represent production practices and materials considered typical of a well managed vineyard in the region. The costs, materials, and practices shown in this study will not be applicable to all situations. Establishment and cultural practices vary by grower and the differences can be significant. *The use of trade names in this report does not constitute an endorsement or recommendation by the University of California or the Lodi District Grape Growers Association nor is any criticism implied by omission of other similar products.*

Farm. The hypothetical farm located on the valley floor in the Lodi Appellation of San Joaquin and Sacramento counties is owned, managed and operated by the owner. The 200 contiguous acre farm consists of 135 acres of mature vineyards in production, 60 acres of wine grapes being established, and five acres occupied by roads, irrigation systems, fencing, and farmstead.

Establishment Cultural Practices and Material Inputs

The following practices refer to table 1.

Vineyard Conversion and Site Preparation. The new vineyard is being planted on land that had an existing vineyard. The old grapevines are removed in the fall. After the vines have been pushed out and burned, the land is slip plowed twice to a depth of 5-6 feet to break up hardpan, improve root and water penetration and also pull up additional roots remaining from the previous vines. The ground is then disced two times. The field is fumigated untarped, and immediately disced and cultipacked in a single operation to seal the fumigated surface. The field is floated one time. The following spring the ground is cultivated (disced) two times. A pre-emergent, residual herbicide is applied during the first discing and the material further incorporated with the second discing. All operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year. Vineyard removal, slip plowing, and fumigation are done by contract or custom operators.

Vines. Potted benchgraft vines, Cabernet Sauvignon variety, are planted on a 7' x 10' spacing at 622 vines per acre. Vines are trained to a bilateral cordon at 44 inches and spur pruned. Cordons are the horizontal branches and spurs or shoots are the bearing units on the cordon. The grapevines are assumed to begin yielding fruit in three years and produce for an additional 22 years.

Planting. Planting the vineyard starts in early spring by laying out and marking vine sites. The drip line is laid on top of the ground and turned on to ease digging by hand, if the ground is dry. The potted plants are placed in the planting hole and covered with soil. The following year an average of 2% or 13 vines per acre will be replanted.

Trellis System. The trellis system is designed to support a bilateral cordon trained and spur pruned vineyard. The system in this study utilizes metal T posts at each vine with end posts at row ends to anchor the wires. Five permanent wires are secured to the end posts and attached to the metal T posts. The owner and hired workers install the trellis system. The system is considered as part of the vineyard since it will be removed when the vines are removed. Therefore it is included as part of the establishment cost. The trellis system is installed during the first 2 years as follows:

First Year. In the fall of the first year or spring of the second (second year in this study), T posts and six end posts are installed. Seven-foot metal T posts are set at each vine location and end stakes are pounded into the soil at the row ends.

Second Year. The wires are strung from end post to end post. Four 12 gauge, high tensile, cordon and catch (top) wires are attached with a clip to each metal T post. Cross arms are attached to alternate posts. The bottom strand is 13 gauge, high tensile wire also permanently attached to the end and T posts. The drip irrigation line is suspended from this bottom strand with drip clips.

Pruning/Training. Pruning in this study includes pruning, training, tying, suckering, shoot positioning and thinning. All operations are not done each year, nor are all the operations used for other training methods or trellis systems. The prunings are placed in between the vine rows and are chopped during the first discing.

First Year. The vines are winter pruned. During dormancy vines are pruned back to two bud spurs to provide shoots of which one is selected for trunk development.

Second Year. The vines are green tied, which includes suckering, tying, and vine training. Suckering is the removal of sprouts from the rootstock that compete with the main trunk and cordons for water and nutrients. Vines are trained by tying one shoot up the T post to become the main trunk. Later in the season this shoot is topped at or slightly below the cordon wire. Two lateral shoots are selected from the trunk as the bilateral cordons. Any remaining lower laterals are also pruned and the cordons cut back to the appropriate length as determined by girth. Green tying is done from May through July.

Third Year. Training vines continues by extending the cordons along the permanent cordon wire and selecting spur positions. Canes from spurs are pruned appropriately. Slower growing vines continue to be trained; however, year three is the last year that the vines are trained in this study. After vines are trained, canopy management including shoot positioning, thinning, and suckering trunks and cordons will also start. The number of hours per acre needed to prune declines from the previous year, but remains constant in the years thereafter.

Irrigation. Irrigation cost in the tables includes pumped water plus labor. In this study water is calculated to cost \$54.00 per acre-foot. No assumption is made about effective rainfall. During the first two years, irrigations begin in May and end around September. In the third year additional irrigations are made postharvest. The amount of water applied to the vineyard period varies each year as shown in Table A.

Year	AcIn/Year		Total
	Preharvest	Postharvest	
1	6	0	6
2	6	0	6
3+	13	3	16

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. Insect management begins in the third year. Leafhoppers (*Erythroneura elegantula* Osborn, and *E. variabilis* Beamer) can cause serious problems. They are controlled in June by a single application of Provado. The material is applied with the grower’s tractor and vineyard sprayer.

Diseases. Many pathogens attack grapevines, but the major disease assumed in this study is powdery mildew (*Uncinula necator*). Powdery mildew control begins the third year. Sulfur dust is applied four times and Rally, a sterol inhibitor, two times.

Weeds. Prior to planting, Treflan, a preemergent herbicide, is applied with a spray boom attached to the front of a disc. Incorporation is completed with a second discing. The row centers are cultivated (disced) three to five times per season during the establishment years. The vine rows are strip sprayed with a combination of residual herbicides such as Prowl and Goal in late fall or winter during the first two years. Princep and Karmex are used in the winter beginning in the third year. Summer weed control along the vine row begins in the second year with applications of Roundup, a foliar herbicide.

Vertebrate. Jackrabbits (*Lepus californicus*) are the major pest, although cottontail (*Sylvilagus audubonii*), and brush rabbit (*S. bachmani*) can also cause damage. Milk cartons placed around the young vines at planting protect the vines from rabbit damage. Another method is to build a fence around the vineyard.

Fertilization. Nitrogen at 25 pounds per acre (1,250 pounds of material) is applied as 2-2-10 in the first year and as 5-0-12 (500 pounds of material) during the remaining years. The material in year one also supplies 25 pounds of phosphorous and 125 pounds of potassium. The 5-0-12 applied in the second year supplies 60 pounds of potassium.

Harvesting. Harvesting starts in the third year. In this study the crop is custom harvested by machine. Hauling to the crusher is contracted and paid by the grower.

Yield. Typical annual yields for Cabernet Sauvignon in the Lodi Appellation (District 11) are shown in Table B.

Year:	3	4+
Tons Per	3.0	7.0

Production Cultural Practices and Material Inputs

Refer to tables 2 - 7

Pruning. Pruning is done during the winter months. The prunings are placed in the vine centers and chopped during the first discing. Winter tying, where cordons are tied to the cordon wire with twine at the trunk and at each end of the cordons is done in March. Subsequently, trunk suckering is done in April, shoot removal in May, and leaf removal in June. Suckering is the removal of water sprouts from the trunk and below the soil surface. Shoot removal is the operation whereby the weak shoots, which lack vigor and do not originate from the fruiting spur buds, are removed. In other varieties such as Zinfandel, the clusters are thinned later (cluster thinning) in the season to reduce crop load or remove clusters that may be delayed in maturity or potential rot sites due to compactness. During leaf removal the basal leaves are removed in and around the fruit zone to allow for exposure and better air movement. Shoot positioning, thinning, and suckering trunks and cordons continue through the production years. Positioning and thinning shoots allows vines space to develop good fruit clusters, and opens the canopy to allow greater air movement through the vines and around the clusters. Pruning costs in this study are based on an hourly rate, although much of the pruning in the region is done by piecework.

Fertilization. Fertilizer is applied through the irrigation system throughout the year. In this study a fertilizer containing nitrogen and potassium (5-0-12) is applied equally in May and October at a rate of 15 pounds of N and 30 pounds of K per acre per application.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Grapes*. **Pesticides mentioned in the study are not recommendations, but those commonly used in the region.** For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. Written recommendations are required for many pesticides and are made by licensed pest control advisors (PCA's). In addition the PCA will monitor the field for 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. For information and pesticide use permits, contact the local county agricultural commissioner's office.

Weeds. Herbicide choice is a function of weed pressure which can change over time. In this vineyard vine row weeds are controlled with a tank mix of Princep (simazine) and Karmex (diuron) applied as a strip spray during January. Resident vegetation in the row centers is managed with four discings per season. Roundup, a foliar herbicide, is used primarily for in season weed control in the vine row, which is 25% of the acreage.

Insects. 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. Leafhoppers and mites are important pests, but will usually not occur in the same year. In this study Provado is used to control leafhoppers. Mites are controlled with Omite, the cost is assumed to be similar to leafhopper control cost and therefore not included in the study. Incidental pests such as OLR, leaf roller, and thrip are not accounted for.

Diseases. Powdery mildew treatments begin in April with five dusting sulfur applications at 12 to 14 day intervals followed by two sterol inhibitors (Rally) applications.

Harvest. The crop is machine harvested by a custom operator. Hauling to the crusher is contracted and the grower pays \$15 per load for local hauls. Additional charges will apply for hauls considered being out of the local area.

Yields. Yield maturity is reached in the fourth year. An assumed yield of 7 tons per acre is used to calculate returns in the production years. Typical yield range for Cabernet Sauvignon in the Lodi Appellation is 6.5 to 7.5 tons per acre. Annual yields are measured in tons as shown in Table B.

Table C. Annual Returns for Cabernet Sauvignon Lodi Appellation Growers¹ District 11

Year	\$/Ton		Weighted Average
	Low	High	
1997	400	1,511	789
1998	400	2,000	804
1999	400	1,466	697
2000	300	1,400	582
Average	375	1,680	718

¹Final Grape Crush Report 1997 - 2000

Returns. Return prices per ton for wine grapes are determined by variety and percent sugar (Brix). The effect of sugar percentages on prices (low and high) is shown in Table C for District 11 growers. The lowest price in the last four years is \$300 per ton while the high is \$2,000; the average 2000 weighted price for Cabernet Sauvignon is \$582 per ton. Use of return prices for grapes is for calculating net returns to growers at different yields and price as shown in Table 7. An estimated price of a \$600 per ton for Cabernet Sauvignon wine grapes is used in this study.

Assessments. The Lodi-Woodbridge Winegrape Commission assesses growers \$0.0045 on the gross value (yield x returns) and the California Department of Food and Ag assesses growers \$0.003 on the gross value for the Glassy Winged Sharpshooter Insect program.

Labor. Hourly wages for workers are \$10.50 for machine operators and \$6.75 per hour non-machine labor. Adding 34% for the employers share of federal and state payroll taxes, insurance, and other possible benefits gives the labor rates shown of \$14.07 and \$9.05 per hour for machine labor and non-machine labor, respectively. 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.

OVERHEAD COSTS

Cash Overhead. 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. Cash overhead costs are included in Tables 2-6.

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.

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 10.51% 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.

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 0.666% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$767 for the entire farm.

Office Expense. Office and business expenses are estimated at \$100 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges.

Sanitation Services. Sanitation services provide portable toilets for the vineyard and cost the farm \$2,016 annually. The cost for this includes a double toilet, delivery and 9 months of weekly service.

Management/Supervisor Wages. A salary for a manager is included to indicate that a cash cost for professional supervision of the vineyard is incurred. An expense of \$67,000 per year that includes 34% for payroll overhead and insurance benefits is used in this study.

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

Non-cash Overhead. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Farm equipment in the region is purchased new or used. 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.

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 6.70% 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, depreciation, and interest 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 \$10,967 per acre or \$658,020 for the 60-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 a well that has been refurbished. A new pump, motor, and filtration/injector station is being installed along with the drip irrigation system during planting. The 2 wells, 15 hp motor, pump, filtration station, fertilizer injector system, drip lines and the labor to install the components are included in the irrigation system cost. Water is pumped from a 100-foot depth. The irrigation system is considered an improvement to the property and has a 25-year life.

Land. Bare land is valued at \$12,000 per acre or \$12,307 per net plantable (195) acre .

Building. The shop building is a 40'X 60' metal building on a cement slab.

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

Fuel Tanks. Two 500-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 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 repairs, fuel, and lubrication. The fuel, lube, and repair cost per acre for each operation in Table 1 is determined by multiplying the total hourly operating cost in Table 5 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.

Repairs, Fuel and Lube. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by 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 \$1.26 and \$1.51 per gallon, respectively.

Risk. The risks associated with producing and marketing wine grapes are high. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks which affect the profitability and economic viability.

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

Acknowledgements. The Lodi District Grape Growers Association provided assistance in furnishing information for this study. Appreciation is expressed to those growers and other cooperators who provided support.

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For information concerning the above or other University of California publications, contact UC DANR Communications Services at 1-800-994-8849, online at www.ucop.edu, or your local county UC Cooperative Extension office.

UC COOPERATIVE EXTENSION
Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A VINEYARD
 SAN JOAQUIN VALLEY NORTH – LODI APPELLATION 2001

	Cost Per Acre			
	Year:	1st	2nd	3rd
Tons Per Acre:				3
Planting Costs:				
Vineyard Removal		350		
Land Preparation - Slip Plow 2X		600		
Land Preparation - Disc 2X		50		
Land Preparation - Fumigate 100%		1,200		
Land Preparation - Cultivate 1X (Disc + Cultipacker)		25		
Land Preparation - Apply Herbicide & Incorporate		29		
Land Preparation - Float 1X		18		
Mark , Layout, Stake Vineyard		1,008		
Dig Hole, Plant, Wrap Vines		218	21	
Vines: 622 Per Acre (2% Replant In 2nd Year)		1,866	39	
TOTAL PLANTING COSTS		5,364	60	
Trellis System Costs:				
Install T Posts & End Posts			1,277	
Spool, Stretch & Tie Wires			389	
Install Cross Arms			371	
Hang Drip Line on Bottom Wire			40	
TOTAL TRELLIS SYSTEM COSTS			2,077	
Cultural Costs:				
Prune			104	150
Irrigate	50	60		125
Fertilizer - Nitrogen	41	41		49
Green Tie (Sucker, Tie & Train) 3X			636	330
Weed Control - Winter Strip Spray	44	28		17
Weed Control - Hand Weed	120	120		
Weed Control - Disc (3X 1st Year, 5X Year 2-3)	30	52		52
Weed Control - Spot Spray (25% of Acreage)		30		30
Insect Control - Leafhoppers				36
Shoot Positioning/Thin				149
Disease Control - Mildew - 7X				71
Trim Vines				10
Pickup Truck Use	19	19		20
ATV Use	16	16		16
TOTAL CULTURAL COSTS	320	1,106		1,055
Harvest Costs:				
Pick Fruit				260
Haul To Crusher				45
TOTAL HARVEST COSTS				305
Assessments:				
Assessments				13
TOTAL ASSESSMENT COSTS				13
Interest On Operating Capital @ 10.51%		369	157	47
TOTAL OPERATING COSTS/ACRE		6,053	3,400	1,420

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Table 1. continued

Year	Cost Per Acre		
	1st	2nd	3rd
Tons Per Acre			3
Cash Overhead Costs:			
Office Expense	100	100	100
Liability Insurance	4	4	4
Sanitation Fees	10	10	10
Managers Salary	344	344	344
Property Taxes	133	133	133
Property Insurance	7	7	7
Investment Repairs	33	33	33
TOTAL CASH OVERHEAD COSTS	631	631	631
TOTAL CASH COSTS/ACRE	6,684	4,031	2,052
INCOME/ACRE FROM PRODUCTION			1,800
NET CASH COSTS/ACRE FOR THE YEAR	6,684	4,031	252
PROFIT/ACRE ABOVE CASH COSTS			0
ACCUMULATED NET CASH COSTS/ACRE	6,684	10,715	10,967
Capital Recovery:			
Shop Building	28	28	28
Fuel Tanks	1	1	1
Shop Tools	6	6	6
Drip Irrigation System	104	104	104
Land	825	825	825
Equipment	39	29	45
TOTAL INTEREST ON INVESTMENT	1,003	993	1,009
TOTAL COST/ACRE FOR THE YEAR	7,687	5,024	3,061
INCOME/ACRE FROM PRODUCTION			1,800
TOTAL NET COST/ACRE FOR THE YEAR	7,687	5,024	1,261
NET PROFIT/ACRE ABOVE TOTAL COST			
TOTAL ACCUMULATED NET COST/ACRE	7,687	12,711	13,972

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE to PRODUCE WINE GRAPES
 SAN JOAQUIN VALLEY NORTH – LODI APPELLATION 2001

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre					Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent			
Cultural:								
Prune	30.00	272	0	0	0	272		
Weed Control - Disc 4X	1.58	27	15	0	0	42		
Winter Tie	8.83	80	0	15	0	95		
Shoot Removal/Positioning	16.50	149	0	0	0	149		
Trunk Suckering	5.50	50	0	0	0	50		
Irrigate	6.60	60	0	72	0	132		
Fertilize - Nitrogen	0.00	0	0	37	0	37		
Disease Control - Mildew 7X	1.14	19	9	48	0	76		
Green Tie (Sucker Tie Train) 2X	8.00	72	0	0	0	72		
Leaf Removal	16.50	149	0	0	0	149		
Trim Vines	0.69	12	8	0	0	19		
Pest Control - Leafhoppers	0.20	3	2	31	0	36		
Weed Control - Spot Spray 25%	0.47	16	2	14	0	32		
Weed Control - Winter Strip	0.47	8	2	7	0	17		
Pickup Truck Use	0.86	15	5	0	0	20		
ATV Use	0.86	15	1	0	0	16		
TOTAL CULTURAL COSTS	98.21	946	44	191	0	1,161		
Harvest:								
Machine Harvest Fruit	0.00	0	0	0	260	260		
Haul To Crusher	0.00	0	0	0	105	105		
TOTAL HARVEST COSTS	0.00	0	0	0	365	365		
Assessments:								
Assessments	0.00	0	0	34	0	34		
TOTAL ASSESSMENT COSTS	0.00	0	0	34		34		
Interest on operating capital @ 10.51%							62	
TOTAL OPERATING COSTS/ACRE		946	44	257	365		1,673	
Cash Overhead:								
Office Expense							100	
Liability Insurance							4	
Sanitation Fees							10	
Manager Salary							344	
Property Taxes							188	
Property Insurance							43	
Investment Repairs							33	
TOTAL CASH OVERHEAD COSTS							722	
TOTAL CASH COSTS/ACRE							2,395	
Non-cash Overhead:								
		Per Producing Acre		Annual Cost Capital Recovery				
Building 40'X60'		308		28			28	
Fuel Tanks 2 -500 gal		18		1			1	
Tools-Shop/Field		62		6			6	
Irrigation System		1,247		104			104	
Land		12,308		825			825	
Vineyard Establishment		10,967		967			967	
Equipment		355		42			42	
TOTAL NON-CASH OVERHEAD COSTS		25,263		1,974			1,974	
TOTAL COSTS/ACRE							4,369	

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS PER ACRE to PRODUCE WINE GRAPES
 SAN JOAQUIN VALLEY NORTH – LODI APPELLATION 2001

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Wine Grapes	7.00	ton	600	4,200	
OPERATING COSTS					
Vine Aids:					
Tying Materials	1.00	acre	15.00	15	
Irrigation:					
Water	16.00	acin	4.50	72	
Fertilizer:					
5-0-12 (Liquid)	30.00	lb N	1.23	37	
Fungicide:					
Sulfur Dust	75.00	lb	0.13	10	
Rally	8.00	oz	4.75	38	
Insecticide:					
Provado Solupak	.75	oz	40.90	31	
Herbicide:					
Roundup Ultra	2.00	pint	6.83	14	
Princep Caliber 90	1.00	lb	4.56	5	
Karmex DF	0.50	lb	5.09	3	
Contract:					
Machine Harvest	1.00	acre	260.00	260	
Haul to Crusher	7.00	ton	15.00	105	
Assessment:					
Lodi Woodbridge Winegrape Commission	4,200.00	gross value	0.01	21	
Glassy Winged Sharpshooter Program	4,200.00	gross value	0.00	13	
Labor (machine)	7.54	hrs	14.07	106	
Labor (non-machine)	92.83	hrs	9.05	840	
Fuel - Gas	2.74	gal	1.51	4	
Fuel - Diesel	14.56	gal	1.26	18	
Lube				3	
Machinery repair				18	
Interest on operating capital @ 10.51%				62	
TOTAL OPERATING COSTS/ACRE				1,673	
NET RETURNS ABOVE OPERATING COSTS				2,527	
CASH OVERHEAD COSTS:					
Office Expense				100	
Liability Insurance				4	
Sanitation Fees				10	
Manager Salary				344	
Property Taxes				188	
Property Insurance				43	
Investment Repairs				33	
TOTAL CASH OVERHEAD COSTS/ACRE				722	
TOTAL CASH COSTS/ACRE				2,395	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Building 40'X60'				28	
Fuel Tanks 2 X 500 gal				1	
Tools-Shop/Field				6	
Irrigation System				104	
Land				825	
Vineyard Establishment				967	
Equipment				42	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,974	
TOTAL COSTS/ACRE				4,369	
NET RETURNS ABOVE TOTAL COSTS				-169	

UC COOPERATIVE EXTENSION
Table 4. MONTHLY CASH to PRODUCE WINE GRAPES
 SAN JOAQUIN VALLEY NORTH-LODI APPELLATION 2001

Beginning JAN 01 Ending DEC 01	JAN 01	FEB 01	MAR 01	APR 01	MAY 01	JUN 01	JUL 01	AUG 01	SEP 01	OCT 01	NOV 01	DEC 01	TOTAL
Cultural:													
Prune	272												272
Weed Control - Disc 4X			10	10	10	10							42
Winter Tie			95										95
Shoot Removal/Positioning					149								149
Trunk Suckering				50									50
Irrigate					42	21	22	22		23			132
Fertilize - Nitrogen					18					18			37
Disease Control - Mildew 7X					17	34	24						76
Green Tie (Sucker Tie Train)					36	36							72
Leaf Removal						149							149
Trim Vines						10			10				19
Pest Control - Leafhopper						36							36
Weed Control - Spot Spray						32							32
Weed Control - Winter Strip	17												17
Pickup Truck Use	2	2	2	2	2	2	2	2	2	2	2	2	20
ATV Use	1	1	1	1	1	1	1	1	1	1	1	1	16
TOTAL CULTURAL COSTS	291	3	108	63	277	332	50	25	13	45	3	3	1,213
Harvest:													
Machine Harvest Fruit									260				260
Haul To Crusher									105				105
Assessments									34				34
TOTAL HARVEST COSTS									399				399
Interest on operating capital	3	3	4	4	7	9	10	10	14	0	0	0	62
TOTAL OPERATING COSTS/ACRE	294	6	112	67	284	341	60	35	425	44	3	3	1,673
OVERHEAD:													
Office Expense	8	8	8	8	8	8	8	8	8	8	8	8	100
Liability Insurance	4												4
Sanitation Fees	1	1	1	1	1	1	1	1	1	1	1	1	10
Manager Salary	29	29	29	29	29	29	29	29	29	29	29	29	344
Property Taxes	188												188
Property Insurance	22						22						43
Investment Repairs	3	3	3	3	3	3	3	3	3	3	3	3	33
TOTAL CASH OVERHEAD COSTS	254	41	41	41	41	41	62	41	41	41	41	41	722
TOTAL CASH COSTS/ACRE	548	46	152	108	324	382	122	76	465	85	43	43	2,395

UC COOPERATIVE EXTENSION
**Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
and BUSINESS OVERHEAD COSTS**
SAN JOAQUIN VALLEY NORTH, LODI APPELLATION 2001

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
01	30 HP 4WD Tractor	19,305	12	4,827	2,117	80	121	2,318
01	70 HP 4WD Tractor	45,000	12	11,251	4,935	187	281	5,404
01	ATV 4WD	4,500	7	1,707	627	21	31	679
01	Disc - Tandem 7'	5,500	15	528	571	20	30	621
01	Duster - 3 Pt	3,500	10	619	446	14	21	480
01	Orch Sprayer 400 Gal	20,000	10	3,537	2,549	78	118	2,745
01	Pickup Truck 1/2 Ton	23,000	7	8,725	3,206	106	159	3,470
01	Vine Trimmer	8,500	15	228	906	29	44	979
01	Weed Sprayer 200 Gal	4,000	10	707	510	16	24	549
TOTAL		133,305		32,129	15,867	551	827	17,245
6C % of New Cost *		79,983		19,277	9,520	331	496	10,347

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Building 40'X60'	60,000	20		5,532	200	300	1,200	7,232
Irrigation System	243,150	25		20,304	810	1,216	4,863	27,192
Fuel Tanks 2-500 gal	3,500	25	1,295	271	16	24	70	381
Land	2,400,000	25	2,400,000	160,800	0	24,000	0	184,800
Tools-Shop/Field	12,000	15	1,133	1,247	44	66	240	1,596
Vineyard Establishment	658,020	22		58,017	2,191	3,290	0	63,498
TOTAL INVESTMENT	3,376,670		2,402,428	246,171	3,260	28,895	6,373	284,699

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	200	acre	3.83	766
Manager Salary	195	acre	343.59	67,000
Office Expense	195	acre	100.00	19,500
Sanitation Fees	195	acre	10.33	2,014

UC COOPERATIVE EXTENSION
Table 6. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY NORTH – LODI APPELLATION 2001

Yr	Description	COSTS PER HOUR							Total Costs/Hr.
		Actual Hours Used	Capital Recovery	Cash Overhead			Operating		
				Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
01	30 HP 4WD Tractor	264.40	4.81	0.18	0.27	0.85	2.13	2.98	8.24
01	70 HP 4WD Tractor	712.30	4.16	0.16	0.24	1.98	4.98	6.96	11.51
01	ATV 4WD	242.80	1.55	0.05	0.08	0.33	1.16	1.49	3.17
01	Disc - Tandem 7'	309.00	1.11	0.04	0.06	1.71	0.00	1.71	2.92
01	Duster - 3 Point	147.20	1.82	0.06	0.08	0.49	0.00	0.49	2.45
01	Orch Sprayer 400 Gal	133.30	11.47	0.35	0.53	2.81	0.00	2.81	15.16
01	Pickup Truck 1/2 Ton	242.80	7.92	0.26	0.39	1.68	4.34	6.02	14.59
01	Vine Trimmer	191.30	2.84	0.09	0.14	3.33	0.00	3.33	6.40
01	Weed Sprayer 200 Gal	183.50	1.67	0.05	0.08	0.56	0.00	0.56	2.36

UC COOPERATIVE EXTENSION
Table 7. RANGING ANALYSIS
 SAN JOAQUIN VALLEY NORTH – LODI APPELLATION 2001

COSTS PER ACRE AT VARYING YIELD TO PRODUCE WINE GRAPES

	YIELD (tons/acre)						
	5.50	6.00	6.50	7.00	7.50	8.00	8.50
OPERATING COSTS:							
Cultural Cost	1,213	1,213	1,213	1,213	1,213	1,213	1,213
Harvest Cost (includes assessment)	376	384	391	399	406	414	421
Interest on operating capital	62	62	62	62	62	62	62
TOTAL OPERATING COSTS/acre	1,650	1,658	1,666	1,673	1,681	1,688	1,696
Total Operating Cost/Ton	300	276	256	239	224	211	200
CASH OVERHEAD COSTS/acre							
CASH OVERHEAD COSTS/acre	722	722	722	722	722	722	722
TOTAL CASH COSTS/acre	2,373	2,380	2,388	2,395	2,403	2,410	2,418
Total Cash Costs/Ton	431	397	367	342	320	301	284
NON-CASH OVERHEAD COSTS/acre							
NON-CASH OVERHEAD COSTS/acre	1,974	1,974	1,974	1,974	1,974	1,974	1,974
TOTAL COSTS/acre	4,346	4,354	4,361	4,369	4,377	4,384	4,392
Total Costs/Ton	790	726	671	624	584	548	517

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR WINE GRAPES

PRICE \$/ton	YIELD (ton/acre)						
	5.50	6.00	6.50	7.00	7.50	8.00	8.50
300.00	0	142	284	427	569	712	854
400.00	550	742	934	1,127	1,319	1,512	1,704
500.00	1,100	1,342	1,584	1,827	2,069	2,312	2,554
600.00	1,650	1,942	2,234	2,527	2,819	3,112	3,404
700.00	2,200	2,542	2,884	3,227	3,569	3,912	4,254
800.00	2,750	3,142	3,534	3,927	4,319	4,712	5,104
900.00	3,300	3,742	4,184	4,627	5,069	5,512	5,954

NET RETURN PER ACRE ABOVE CASH COST FOR WINE GRAPES

PRICE \$/ton	YIELD (ton/acre)						
	5.50	6.00	6.50	7.00	7.50	8.00	8.50
300.00	-723	-580	-438	-295	-153	-10	132
400.00	-173	20	212	405	597	790	982
500.00	377	620	862	1,105	1,347	1,590	1,832
600.00	927	1,220	1,512	1,805	2,097	2,390	2,682
700.00	1,477	1,820	2,162	2,505	2,847	3,190	3,532
800.00	2,027	2,420	2,812	3,205	3,597	3,990	4,382
900.00	2,577	3,020	3,462	3,905	4,347	4,790	5,232

NET RETURNS PER ACRE ABOVE TOTAL COST FOR WINE GRAPES

PRICE \$/ton	YIELD (ton/acre)						
	5.50	6.00	6.50	7.00	7.50	8.00	8.50
300.00	-2,696	-2,554	-2,411	-2,269	-2,127	-1,984	-1,842
400.00	-2,146	-1,954	-1,761	-1,569	-1,377	-1,184	-992
500.00	-1,596	-1,354	-1,111	-869	-627	-384	-142
600.00	-1,046	-754	-461	-169	123	416	708
700.00	-496	-154	189	531	873	1,216	1,558
800.00	54	446	839	1,231	1,623	2,016	2,408
900.00	604	1,046	1,489	1,931	2,373	2,816	3,258