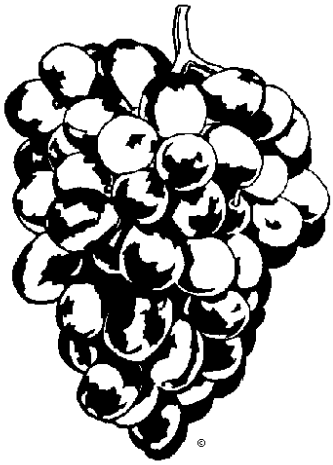
1998

UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION

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



SAUVIGNON BLANC
LAKE COUNTY

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Sauvignon Blanc
Lake County

INTRODUCTION

The detailed costs for vineyard establishment and wine grape production in Lake County are presented in this study. The hypothetical farm used in this report consists of a total of 40 acres, 35 of which are being established, 5 acres are in farmstead, roads, and pumping stations.

This study consists of Assumptions to Establish a Vineyard and Produce Table Grapes and eight tables. It is intended as a guide only. It can assist in production decisions, determining potential returns, and prepare budgets. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to every situation. A blank, *Your Cost,* column is provided to enter your actual costs on Table 2 Costs Per Acre To Produce Wine Grapes and Table 3 Costs And Returns Per Acre to Produce Wine Grapes.

Tables included:

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

For an explanation of calculations used for the study refer to the attached Assumptions, call the Department of Agricultural and Resource Economics, Cooperative Extension, University of California, Davis, California, (530) 752-3589 or call Lake County farm advisor Rachel Elkins (707) 263-2281.

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

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Sauvignon Blanc, Lake County

ASSUMPTIONS

The following are assumptions pertaining to sample costs to establish a vineyard and produce wine grapes in Lake County. Practices described are not recommendations by the University of California, but represent production procedures and materials considered typical of a well managed vineyard in Lake County. Costs and practices detailed in this study may not be applicable to all situations. Establishment and cultural practices vary by grower and region; variations can be significant. These costs are represented on an annual, per acre basis. **The use of trade names in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products**.

Land. The vineyard is owned, managed, and operated by the grower. The vineyard is located in Lake County and is situated on land previously planted to orchards. The farm is comprised of 40 acres, 35 of which are planted with wine grapes. The other 5 acres are occupied by roads, irrigation systems, and farmstead. Land is valued at $7,500 per acre. This study assumes the land was purchased for planting a vineyard. Because only 35 of the 40 acres are planted to grapes, land is valued at $8,571 per plantable acre.

Vines. Sauvignon Blanc vines are planted on a 7' x 11' spacing with 566 vines per acre during the first spring. In the second year 2% or 11 vines per acre are replanted for those lost in the first year. Vines will be trained to up the t-post during the second and third years. The grapevines are expected to begin yielding fruit in three years and then be productive for an additional 22 years.

Trellis System. The trellis system is designed to support a quadrilateral, cordon-trained, and spur-pruned vineyard. Installation of the trellis system is performed by the owner and hired workers in the first two year. The trellis system is considered part of the vineyard since it would be removed at the time of vine removal and is shown in the vineyard establishment costs in Table 1. The following details the trellis system installation.

First Year Once the vineyard is laid out an end post is placed at each end of the rows. A three-foot screw anchor is drilled into the ground and wires are run up to the end post to keep it upright against tension. In between the end posts a nine-foot t-post is driven into the ground at the site of every other vine. The nine-foot posts will have the drip wire and crossarms attached and support the fruiting and foliage wires. At the alternate vine site a five-foot t-post is pounded into the row to allow the vine to be trained up the fruiting wires which are 40-42 inches above the ground. The 14 gauge drip line is clipped to each nine-foot post and anchored at the end of each row at the screw anchor. The drip irrigation line is attached to the drip wire.

Second Year A set of three crossarms are attached to each nine-foot t-post. Each crossarm varies in size from 36-48 inches with the largest at the top of the post, tapering down to the smallest at the bottom. The two top crossarms each have four 14 gauge, movable foliage wires; the lower arm carries two 12 gauge fruiting wires. The foliage wires are moved during the season as vines grow.

Irrigation and Frost Protection System. Since the vineyard is established on land previously planted to orchards, it is assumed to have a well which will be refurbished and a new pump, motor, and filtration/injector station will be installed along with the drip irrigation system during to planting. The well, 15 hp motor, pump, filtration station, fertilizer injector system, drip lines and the labor to install of these components is included in the irrigation system cost. Water is pumped to the vineyard after running through a filtration station into the drip lines along the vine rows. The well, 15 hp motor, pump, filtration station, drip lines, and the labor to install of these components is included in the irrigation system cost. The irrigation system is considered an improvement to the property and has a 25 year life. Therefore, it is not found in preplant operations in Table 1 establishment costs, rather it is shown in the non-cash overhead sections as capital recovery cost of various tables and the Investments portion of Table 5.

The frost protection system consists of a 10 acre-foot reservoir, a 90 hp motor and pump, and overhead sprinklers. The reservoir is designed to hold enough water to protect the vineyard during the frost season. Water is pumped by the 90 hp booster pump to the overhead sprinklers. It is assumed that the vineyard will need frost protection for 12 nights during the season and the system will run for 6 hours per night. The reservoir, pump, and sprinklers are an investment, separate from the vineyard, and their costs are found in Table 5, Annual Equipment, Investment, and Overhead Costs. The cost of water used for frost protection is the cost of water pumped from the irrigation well to the reservoir and the cost to operate the booster pump during freezing periods.

Pumped water plus labor constitute the irrigation/frost protection cost. The cost is based on using 15 hp motor to pump from 75 feet deep over 35 acres. Price per acre-foot of water will vary by grower in this region depending on quantity pumped, power cost, various well characteristics, and other irrigation factors. In this study water is calculated to cost $4.93 per acre-inch. No assumption is made about effective rainfall.

Irrigations occur from May through August in the first two years and June through August in the third year. Nitrogen fertilizer is injected into the drip system starting the first year. The amount of water applied to the vines varies and are shown in Table A.

Table A. Applied Irrigation Water

Year	Number of	AcIn/Year
1-2	4	2.5
3	4	6.7
4+	4	9.2

ESTABLISHMENT CULTURAL PRACTICES

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

Site Preparation. The land subsoiled twice to a depth of 2-3 feet breaking up any underlying hardpan to improve root and water penetration. Afterwards the ground is disced three times to break up large clods of soil smoothing the ground in advance of leveling. Leveling consists of three passes with a landplane. The following spring a pre-emergent, residual herbicide (Surflan®) is applied for weed control through most of the first year growing season. Subsoiling and leveling are contracted out to commercial companies. Most operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in

the first year. All operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year in Table 1.

Planting. Planting the vineyard starts by laying out and marking vine sites in early spring. The first year's component of the trellis system is installed. Holes are dug, vines are planted, and a milk carton is placed around the vine. In the second year, 2% of the vines or 11 vines per acre are replaced after dying during the first season.

Pruning, Training, and Crop Thinning. A number of similar, but different cultural operations are performed during pruning and training. Not all of the same practices are used for other varieties or trellis systems.

The second year begins with a dormant pruning during the winter. Training includes suckering, tying, and training the selected cordons and spurs. Suckering is the removal of sprouts from the rootstock that compete with the trunk and cordons for water and nutrients.

Training continues in the third year but requires half the labor-hours to complete. Suckering and retying require the majority of the time involved and continues throughout the life of the vineyard.

Insect and Arthropod Management. Insects and mites are managed by using different pesticides and management techniques beginning the first year. Pest populations are monitored to determine when an economically damaging level will occur and which control method to use. From the second year on an application of insecticide is sprayed to manage leafhoppers. Beginning in the third year a miticide is applied in July to control mites.

Disease Management. There are many pathogens that attack grapevines, but the only major disease that is assumed to occur in this study is powdery mildew. A dusting and spraying program for powdery mildew control begins the second year with single application of sulfur dust and increases to eight applications in the third year. Also in the third year, three wettable sulfur treatments are made with the first application mixed into the leafhopper spray. A sterol inhibitor is applied for additional mildew control in the fourth year. All applications are made using a 50 HP tractor and an vineyard sprayer.

Vineyard Floor Management. Weed control in the vine row and middles are managed with hand hoeing, multiple discings, and herbicides. The vine rows are hand hoed during the first two years only. The row middles are disced from March through August. The middles are disced four times every year. The vine rows are stripped sprayed with different herbicides during winter and summer each year. The summer strip spray is applied on only half of the acreage.

Fertilization. Nitrogen is injected into the drip irrigation system beginning in the first year at 10 pounds of N per acre.

Establishment Cost. An 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. It is used to determine the non-cash overhead expense, capital recovery cost, during the production years. The Total Accumulated Net Cash Cost on Table 1 in the third year represents the establishment cost. For this study the cost is $8,640 per acre or $302,400 for the 35 acre vineyard. The establishment cost is amortized over the remaining 22 years the vineyard is in production.

PRODUCTION CULTURAL PRACTICES

Pruning and Suckering. Pruning is done during the winter months and the prunings are first chopped with a flail mower then disced into the row middles. Suckers are removed from the trunks each year.

Vineyard Floor Management. Herbicides and cultivation are use to manage the vineyard floor and control weeds. Four discing are performed in March through August. Vine row weeds are controlled with a pre-emergent herbicide mix applied as a strip spray during the winter and escaped weeds are controlled with a summer application of a contact herbicide.

Insect And Arthropod Management. Pest management techniques used to control insect and disease problems in the last year of vineyard establishment are the same practices used in the production years.

Disease Management. Powdery mildew is treated beginning in April with an application of sulfur dust followed with nine more dustings. Three applications of wettable sulfur are made April through August. One treatment of wettable sulfur is mixed with the leafhopper spray. A single sterol inhibitor treatment is made in July. All of the insect and fungicide sprays are made using the rented 50 HP tractor and vineyard sprayer.

Pesticides, rates, and cultural practices mentioned in this cost study are a few of those listed in the *UC IPM Pest Management Guidelines, Grapes* and *Grape Pest Management*. Written recommendations are required for many pesticides and are made by licensed pest control advisors. For information and pesticide use permits, contact the local county Agricultural Commissioner's office. For additional production information contact Lake County viticulture farm advisors.

Harvest. Harvesting starts in the third year. In this cost study the vineyard contracts to have the grape crop custom harvested by hand and is charged on a per ton basis. The third year the contract rate is $110 per ton because of the small tonnage, but falls to $95 per ton in the fourth year. It is assumed in this study that the grower rents a forklift, several tractors, and 12 gondolas with bins to manage an efficient harvest. Hauling to the crusher is also contracted for and paid by the grower. It is assumed that the grower is hauling to a winery outside of the county and the cost would is approximately $15 per ton.

Assessment. The Lake County Wine Grape Commission (LCWGC) is a local entity performing marketing and research for growers. The current assessment rate is 1% of the gross value of the grapes and is collect by the wineries.

Yields. Wine grapes begin bearing an economic crop in the third year after planting. Yield maturity is reached in the sixth year. An assumed yield of 7 tons per acre is used to calculate cost per ton in production years. The annual yields are measured in tons as shown in Table B.

Table B. Annual Yields for Sauvignon Blanc in Lake County (District 2)

Year	3	4	5	6+
Tons Per Acre	1.5	3.0	5.0	7.0

Returns. Return prices per ton for wine grapes are determined by variety and percent sugar. The effect of sugar percentages on prices is indicated in Table C by the low and high returns received. The lowest price in the last four years was $425 per ton while the high was at $815; the average 1996 price for Sauvignon Blanc was $658 per ton. Use of return prices for grapes is for calculating net returns to growers at different yields and price. Returns, shown in Table 7 will vary and the yields and prices used in this cost study are an estimate taking into consideration variety produced, fruit quality, and current market conditions. An estimated price of a $900 per ton of Sauvignon Blanc wine grapes is used in this study.

Table C. Annual Prices Received by Lake County (District 2) Growers for Sauvignon Blanc Over Five Previous Harvests[1]

	$/Ton		
	Range		Weighted
Year	Low	High	Average
1992	430	775	680
1993	450	738	662
1994	425	815	652
1995	600	750	658
1996	600	682	658
Average	501	752	662

[1] Data compiled from the Final Grape Crush Report, 1992-1996 Crops.

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

Risk is caused by various sources of uncertainty which include production, price, and financial. Examples of these are insect damage, a decrease in price, or an increase in interest rates. Due to the risk involved, access to a market is crucial. A market channel should be determined before vineyards are planted and brought into production.

Labor. Hourly wages for workers are $8.00 and $6.00 per hour for machine and non-machine workers, respectively. Adding 34% for Workers Compensation, Social Security, Medicare, insurance, and other possible benefits gives the labor rates shown of $10.72 and $8.04 per hour for machine labor and non-machine labor, respectively. Labor time for operations involving machinery are 20% higher than the operation time given in Table 2 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair. Wages for a manager are not included as cost. Returns above total costs is considered a return to management and risk.

Cash Overhead. Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm, not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, and equipment repairs.

Property Taxes. Counties in California charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis. The salvage value for land is equal to the purchase price because land does not depreciate from use.

Interest On Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 10.46% per year. A nominal interest rate is the going market cost of borrowed funds.

Insurance. Insurance for farm investments vary depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.713% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $469 for the entire farm.

Office Expense. Office and business expenses for 35 acres are estimated at $6,000 annually or $171 per planted acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

Non-cash Overhead. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Although farm equipment used on farms in Lake County may be purchased new or used, this study shows the current purchase price for new equipment. The new purchase price is adjusted to 50% to indicate a mix of new and used equipment. Annual ownership costs (Equipment and Investments) are shown in Tables 1-3 and 5. They represent the capital recovery cost for investments on an annual per acre basis.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). Put another way, it is equivalent to the annual payment on a loan for the investment with the downpayment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The calculation for the annual capital recovery costs is as follows. . The calculation for the annual capital recovery costs is taken from the publication *Farm Management* (Boehlje and Eidman) and is as follows.

$$\left[\left(\text{Purchase Price} - \text{Salvage Value}\right) \times \text{Capital Recovery Factor}\right] + \left[\text{Salvage Value} \times \text{Interest Rate}\right]$$

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its life. For farm machinery (e.g., tractors and implements) the remaining value is a percentage of the new cost of the investment. The life in years is estimated by dividing the wear-out life, as given by American Society of Agricultural Engineers (ASAE) by the annual use in hours. Salvage value is calculated by Boelje and Eidman as

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

Salvage value for other investments including irrigation systems, buildings, and miscellaneous equipment is zero. The salvage value for land is equal to the purchase price because land does not depreciate from use. The purchase price and salvage value for certain equipment and investments are shown in Table 4.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. It is the function of the interest rate and years of life of the equipment.

Interest Rate. The interest rate of 7.81% used to calculate capital recovery cost is the United States Department of Agriculture-Economic Reporting Service's (USDA-ERS) ten year average of California's agricultural sector long-run real 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, not including inflation. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Equipment Costs. Cash equipment costs are composed of three parts; non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of fuel, lubrication, and repairs.

Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the ASAE. Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO hp, and type of fuel used. The fuel and repair cost per acre for each operation in Table 2. is determined by multiplying the total hourly operating cost in Table 6. for each piece of equipment used for the cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time for a given operation to account for setup time. Prices for on-farm delivery of diesel and gasoline are $0.78 and $1.22 per gallon, respectively.

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REFERENCES

American Society of Agricultural Engineers. 1994. *American Society of Agricultural Engineers Standards Yearbook.* Russell H. Hahn and Evelyn E. Rosentreter (ed.) St. Joseph, Missouri. 41st edition.

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

California Department of Food and Agriculture. 1993. Final Grape Crush Report 1992 Crop. California Agricultural Statistics Service and Federal State Market News Service. Sacramento, California.

California Department of Food and Agriculture. 1994. Final Grape Crush Report 1993 Crop. California Agricultural Statistics Service and Federal-State Market News Service. Sacramento, California.

California Department of Food and Agriculture. 1995. Final Grape Crush Report 1994 Crop. California Agricultural Statistics Service and Federal State Market News Service. Sacramento, California.

California Department of Food and Agriculture. 1996. Final Grape Crush Report 1995 Crop. California Agricultural Statistics Service and Federal State Market News Service. Sacramento, California.

California Department of Food and Agriculture. 1997. Final Grape Crush Report 1996 Crop. California Agricultural Statistics Service and Federal State Market News Service. Sacramento, California.

Integrated Pest Management Education and Publications. 1990. *U.C. Pest Management Guidelines, Grapes. In* M. L. Flint (ed.) UC IPM pest management guidelines. University of California. Division of Agriculture and Natural Resources. Oakland, California. Publication 3339.

University of California, Division of Agriculture and Natural Resources. 1992. *Grape Pest Management*. Donald L. Flaherty, et. Al. (ed.) Second Edition. University of California, Division of Agriculture and Natural Resources. Oakland, California. Publication 3343.

Table 1. U.C. COOPERATIVE EXTENSION
SAMPLE COSTS PER ACRE TO ESTABLISH A VINEYARD
LAKE COUNTY - 1998
SAUVIGNON BLANC

Labor Rate: $10.72/hr. machine labor
$8.04/hr. non-machine labor

Vines Per Acre: 566
Interest Rate: 10.46%

	Cost Per Acre					
Year	1st	2nd	3rd	4th	5th	6th
Tons Per Acre			1.5	3.0	5.0	7.0
Planting Costs:						
Land Preparation - Subsoil 2X	$250					
Land Preparation - Disc 3X	21					
Land Preparation - Landplane 3X	75					
Weed Control - Preplant Spray	34					
Survey & Layout Vineyard	75					
Install Posts & Drip Wire	1,657					
Dig & Plant Vines, Cover Trunks	283					
Vines: 566 Per Acre (2% Replant In 2nd Year)	2,123	$47				
Install Crossarms and Fruiting Wires		1,529				
TOTAL PLANTING COSTS	4,518	1,576				
Cultural Costs:						
Weed Control - Postplant Spray	82					
Prune - Dormant		28	$113	$311	$311	$311
Chop Prunings				7	13	13
Frost Protection - 12 days		68	68	68	68	68
Irrigate & Fertilize	36	36	50	68	68	68
Pest Control - Vertebrates	5	5	5	5	5	5
Training (Sucker, Tie & Train)		283	142			
Weed Control - Hand Hoe	32	48				
Weed Control - Disc Middles 4X	24	24	28	28	28	28
Remove Suckers				60	60	60
Weed Control - Summer Strip Spray			5	5	5	5
Insect Control - Leafhoppers (+ 1 Mildew Control In Year 3+)		22	63	63	63	63
Disease Control - Dust Mildew (1X In Year 3, 8X In Year 3+)		4	39	39	39	39
Disease Control - Spray Mildew 3X (Wettable Sulfur & SI)			17	36	36	36
Move Wires 4X				48	48	48
Leaf Removal				150	150	150
Insect Control - Mites			39	39	39	39
Weed Control - Winter Strip Spray		27	13	13	13	13
Miscellaneous Costs	80	80	80	80	80	80
Pickup Truck Use	42	42	42	42	42	42
TOTAL CULTURAL COSTS	301	667	704	1,062	1,068	1,068

Table 1. Continued

Year	Cost Per Acre 1st	2nd	3rd	4th	5th	6th
Tons Per Acre			1.5	3.0	5.0	7.0
Harvest Costs:						
Pick Fruit			179	306	503	707
Haul To Winery			23	45	75	105
TOTAL HARVEST COSTS			202	351	578	812
Assessment Costs:						
Lake County Wine Grape Commission			14	27	45	63
TOTAL ASSESSMENT COSTS			14	27	45	63
Interest On Operating Capital @ 10.46%	273	121	31	50	55	57
TOTAL OPERATING COSTS/ACRE	5,092	2,364	951	1,490	1,746	2,000
Cash Overhead Costs:						
Office Expense	171	171	171	171	171	171
Liability Insurance	13	13	13	13	13	13
Property Taxes	117	119	119	119	119	119
Property Insurance	83	85	85	85	85	85
Investment Repairs	141	141	141	141	141	141
TOTAL CASH OVERHEAD COSTS	525	529	529	529	529	529
TOTAL CASH COSTS/ACRE	5,617	2,893	1,480	2,019	2,275	2,529
INCOME/ACRE FROM PRODUCTION			1,350	2,700	4,500	6,300
NET CASH COSTS/ACRE FOR THE YEAR	5,617	2,893	130			
PROFIT/ACRE ABOVE CASH COSTS				681	2,225	3,771
ACCUMULATED NET CASH COSTS/ACRE	5,617	8,510	**8,640**	7,959	6,415	4,188
Capital Recovery Cost (7.81% Interest Rate):						
Land @ $7,500 Per Acre	669	669	669	669	669	669
Drip Irrigation System	100	100	100	100	100	100
Frost Protection System	198	198	198	198	198	198
Reservoir - 10 AcFt Capacity	103	103	103	103	103	103
Shop Building	44	44	44	44	44	44
Shop Tools	16	16	16	16	16	16
Fuel Tank & Pump	16	16	16	16	16	16
Equipment	101	131	131	126	126	126
TOTAL CAPITAL RECOVERY COST	1,247	1,277	1,277	1,272	1,272	1,272
TOTAL COST/ACRE FOR THE YEAR	6,864	4,170	2,757	3,291	3,547	3,801
INCOME/ACRE FROM PRODUCTION			1,350	2,700	4,500	6,300
TOTAL NET COST/ACRE FOR THE YEAR	6,864	4,170	1,407	591		
NET PROFIT/ACRE ABOVE TOTAL COST					953	2,499
TOTAL ACCUMULATED NET COST/ACRE	6,864	11,034	12,441	13,032	12,079	9,580

Table 2.

U.C. COOPERATIVE EXTENSION
COSTS PER ACRE TO PRODUCE WINE GRAPE
LAKE COUNTY - 1998
SAUVIGNON BLANC

Labor Rate: $10.72/hr. machine labor
$8.04/hr. non-machine labor
Interest Rate: 10.46%
Yield per Acre: 7.0 Ton

Operation	Time (Hrs/A)	Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
			Cash and Labor Costs per Acre				
Cultural:							
Weed Control - Winter	0.25	3	1	9	0	13	
Prune - Dormant	0.00	0	0	0	311	311	
Chop Brush	0.18	2	1	0	0	3	
Weed Control - Disc Middles 4X	1.33	17	6	0	0	23	
Frost Protection - 12 Days	2.40	19	0	49	0	68	
Pest Control - Vertebrate Pest	0.00	0	0	5	0	5	
Disease Control - Dust Sulfur 8X	1.60	21	6	13	0	39	
Move Wires 4X	6.00	48	0	0	0	48	
Remove Suckers	0.00	0	0	60	0	60	
Leaf Removal	0.00	0	0	150	0	150	
Irrigate & Fertilize	2.00	16	0	52	0	68	
Insect Control - Leafhoppers 2X	0.38	5	2	15	0	21	
Disease Control - Spray Sulfur 3X	1.15	15	5	13	0	32	
Weed Control - Summer Strip	0.21	3	1	2	0	5	
Insect Control - Mites	0.38	5	2	32	0	38	
Miscellaneous Costs	0.00	0	0	0	80	80	
Pickup Truck Use	2.71	35	10	0	0	45	
TOTAL CULTURAL COSTS	18.60	189	32	398	391	1011	
Harvest:							
Harvest	0.00	0	0	0	707	707	
Haul To Winery	0.00	0	0	0	105	105	
TOTAL HARVEST COSTS	0.00	0	0	0	812	812	
Assessment:							
Lake County Wine Grape Commission Assessment (1% Of Gross Returns)	0.00	0	0	63	0	63	
TOTAL ASSESSMENT COSTS	0.00	0	0	63	0	63	
Interest on operating capital @ 10.46%						53	
TOTAL OPERATING COSTS/ACRE		189	32	461	1203	1938	
Office Expense						171	
Liability Insurance						13	
Property Taxes						162	
Property Insurance						115	
Investment Repairs						141	
TOTAL CASH OVERHEAD COSTS						603	
TOTAL CASH COSTS/ACRE						2541	

Table 2. Continued

NON-CASH OVERHEAD:

Investment	Per producing Acre	-- Annual Cost -- Capital Recovery (7.81% Interest Rate)	
Land	8571	669	669
Drip Irrigation System	1050	97	97
Frost Protection System	2070	191	191
Reservoir - 10 AcFt Capacity	1143	99	99
Fuel Tanks & Pump	171	16	16
Buildings	491	42	42
Vineyard Establishment	8640	834	834
Shop Tools	143	16	16
Equipment	1084	141	141
TOTAL NON-CASH OVERHEAD COSTS	23364	2105	2105
TOTAL COSTS/ACRE			4647

U.C. COOPERATIVE EXTENSION

Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE WINE GRAPE
LAKE COUNTY - 1998
SAUVIGNON BLANC

Labor Rate: $10.72/hr. machine labor
$8.04/hr. non-machine labor
Interest Rate: 10.46%

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Wine Grape	7.00	Ton	900.00	6300	
TOTAL GROSS RETURNS FOR WINE GRAPE				6300	
OPERATING COSTS					
Herbicide:					
Goal 1.6E	0.82	Pint	9.79	8	
Princep 4L	0.27	Pint	2.42	1	
Roundup	0.27	Pint	5.95	2	
Contract:					
Pruning	566.00	Vine	0.55	311	
Harvest	7.00	Ton	95.00	665	
Hauling	7.00	Ton	15.00	105	
Water:					
Frost Protection	8.00	AcIn	6.09	49	
Irrigation	9.16	AcIn	4.93	45	
Rodenticide:					
Rodent Bait	5.00	Lb	0.90	5	
Fungicide:					
Dusting Sulfur	80.00	Lb	0.16	13	
Wettable Sulfur	15.00	Lb	0.17	3	
Rubigan EC	5.00	Oz	2.19	11	
Grape Vine:					
Sucker Vines	1.00	Vine	60.00	60	
Leaf Removal	1.00	Acre	150.00	150	
Fertilizer:CAN 17	10.00	Lb N	0.706	7	
Insecticide:					
Dimethoate 25 WP	7.00	Lb	2.00	14	
Miticide: Omite 30W	5.00	Lb	6.38	32	
Rent:					
Forklift	3.00	Acre	6.57	20	
Gondola - 12 Total	3.00	Acre	3.43	10	
Tractors - 3 Total	3.00	Acre	3.86	12	
Misc. & Rental Cost	1.00	Acre	80.00	80	
Assessment:					
LCWGC Assessment	1.00	Acre	63.00	63	
Labor (machine)	9.84	Hrs	10.72	106	
Labor (non-machine)	10.40	Hrs	8.04	84	
Fuel - Gas	5.09	Gal	1.22	6	
Fuel - Diesel	16.33	Gal	0.78	13	
Lube				3	
Machinery repair				10	
Interest on operating capital @ 10.46%				53	
TOTAL OPERATING COSTS/ACRE				1938	

Table 3. Continued

NET RETURNS ABOVE OPERATING COSTS	4362
CASH OVERHEAD COSTS:	
Office Expense	171
Liability Insurance	13
Property Taxes	162
Property Insurance	115
Investment Repairs	141
TOTAL CASH OVERHEAD COSTS/ACRE	603
TOTAL CASH COSTS/ACRE	2541
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY − 7.81% Interest Rate):	
Land	669
Drip Irrigation System	97
Frost Protection System	191
Reservoir - 10 AcFt Capacity	99
Fuel Tanks & Pump	16
Buildings	42
Vineyard Establishment	834
Shop Tools	16
Equipment	141
TOTAL NON-CASH OVERHEAD COSTS/ACRE	2105
TOTAL COSTS/ACRE	4647
NET RETURNS ABOVE TOTAL COSTS	1653

Table 4. U.C. COOPERATIVE EXTENSION
MONTHLY CASH COSTS PER ACRE TO PRODUCE WINE GRAPE
LAKE COUNTY - 1998
SAUVIGNON BLANC

Beginning NOV 97 Ending OCT 98	NOV 97	DEC 97	JAN 98	FEB 98	MAR 98	APR 98	MAY 98	JUN 98	JUL 98	AUG 98	SEP 98	OCT 98	TOTAL
Cultural:													
Weed Control - Winter Spray	13												13
Prune - Dormant					311								311
Chop Brush					3								3
Weed Control - Disc Middles 4X					6			6	6	6			23
Frost Protection - 12 Day						34	34						68
Pest Control - Vertebrate						5							5
Disease Control - Dust Sulfur 8X							10	10	10	10			39
Move Wires 4X							12	24	12				48
Remove Suckers							60						60
Leaf Removal								150					150
Irrigate & Fertilize								17	17	17	17		68
Insect Control - Leafhoppers 2X								21					21
Disease Control - Spray Sulfur 3X									25	7			32
Weed Control - Summer Strip Spray									5				5
Insect Control - Mites									38				38
Miscellaneous Costs	7	7	7	7	7	7	7	7	7	7	7	7	80
Pickup Truck Use	4	4	4	4	4	4	4	4	4	4	4	4	45
TOTAL CULTURAL COSTS	23	10	10	10	331	49	126	239	124	50	27	10	1011
Harvest:													
Harvest											707		707
Haul To Winery											105		105
TOTAL HARVEST COSTS											812		812
Assessment:													
LCWGC Assessment											63		63
TOTAL ASSESSMENT COSTS											63		63
Interest on oper. capital	0	0	0	0	3	4	5	7	8	8	16	-0	53
TOTAL OPERATING COSTS/ACRE	23	11	11	11	334	53	131	245	132	59	918	10	1938
OVERHEAD:													
Office Expense	14	14	14	14	14	14	14	14	14	14	14	14	171
Liability Insurance			13										13
Property Taxes			81						81				162
Property Insurance			58						58				115
Investment Repairs	12	12	12	12	12	12	12	12	12	12	12	12	141
TOTAL CASH OVERHEAD COSTS	26	26	178	26	26	26	26	26	165	26	26	26	603
TOTAL CASH COSTS/ACRE	49	37	189	37	360	79	157	272	296	85	944	36	2541

U.C. COOPERATIVE EXTENSION

Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS
LAKE COUNTY - 1998
SUAVIGNON BLANC

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead - Insurance	Taxes	Total
98	50 HP 4WD Tractor	29953	12	7489	3536	133	187	3857
98	Disc - Offset 8'	9000	10	1592	1219	38	53	1310
98	Duster - 3 Pt	2520	16	214	274	10	14	297
98	Mower/Chopper - 8'	3672	10	649	497	15	22	534
98	Orchard Sprayer - 300 Gal	12208	10	2159	1653	51	72	1776
98	Pickup Truck - 1/2 Ton	16226	7	6155	2403	80	112	2594
98	Weed Sprayer - 100 Gal	2339	10	414	317	10	14	340
TOTAL		75918		18672	9899	337	473	10710
50% of New Cost *		37959		9336	4950	169	236	5355

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

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	------ Cash Overhead ------ Insurance	Taxes	Repairs	Total
INVESTMENT								
Buildings	17200	30	1720	1485	67	95	344	1991
Drip Irrigation System	36750	25		3387	131	184	1103	4805
Frost Protection System	72435	25		6676	258	362	2173	9469
Fuel Tanks & Pump	5985	25	599	543	23	33	60	660
Land	300000	25	300000	23430	2139	3000	0	28569
Reservoir - 10 AcFt Capacity	40000	30	4000	3453	157	220	1200	5030
Shop Tools	5000	15	500	559	20	28	50	656
Vineyard Establishment	302400	22		29201	1078	1512	0	31791
TOTAL INVESTMENT	779770		306819	68733	3874	5433	4930	82970

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	35.00	Acre	13.40	469
Office Expense	35.00	Acre	171.43	6000

U.C. COOPERATIVE EXTENSION

Table 6. HOURLY EQUIPMENT COSTS

LAKE COUNTY - 1998

SUAVIGNON BLANC

Yr	Description	Actual Hours Used	COSTS PER HOUR - Cash Overhead: Capital Recovery	Insurance	Taxes	Operating: Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
98	50 HP 4WD Tractor	211.4	8.37	0.32	0.44	0.46	2.42	2.88	12.00
98	Disc - Offset 8'	46.7	13.06	0.40	0.57	1.19	0.00	1.19	15.22
98	Duster - 3 Pt	56.0	2.45	0.09	0.12	0.32	0.00	0.32	2.98
98	Mower/Chopper - 8'	6.4	38.61	1.20	1.68	1.42	0.00	1.42	42.90
98	Orchard Sprayer - 300 Gal	66.8	12.37	0.38	0.54	1.25	0.00	1.25	14.53
98	Pickup Truck - 1/2 Ton	95.0	12.65	0.42	0.59	0.98	2.63	3.61	17.27
98	Weed Sprayer - 100 Gal	16.2	9.79	0.30	0.43	0.48	0.00	0.48	11.00

Table 7. RANGING ANALYSIS

LAKE COUNTY - 1998

SAUVIGNON BLANC

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE WINE GRAPE

	YIELD (TON/ACRE) 4.0	5.0	6.0	7.0	8.0	9.0	10.0
OPERATING COSTS/ACRE:							
Cultural Cost	1011	1011	1011	1011	1011	1011	1011
Harvest & Assessment Cost	545	655	765	875	985	1095	1205
Interest on operating capital	50	51	52	53	54	55	56
TOTAL OPERATING COSTS/ACRE	1605	1716	1827	1938	2049	2160	2271
TOTAL OPERATING COSTS/TON	401	343	305	277	256	240	227
CASH OVERHEAD COSTS/ACRE	603	603	603	603	603	603	603
TOTAL CASH COSTS/ACRE	2208	2319	2430	2541	2652	2763	2874
TOTAL CASH COSTS/TON	552	464	405	363	332	307	287
NON-CASH OVERHEAD COSTS/ACRE	2105	2105	2105	2105	2105	2105	2105
TOTAL COSTS/ACRE	4314	4425	4536	4647	4758	4869	4979
TOTAL COSTS/TON	1078	885	756	664	595	541	498

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR WINE GRAPE

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Wine Grape	4.0	5.0	6.0	7.0	8.0	9.0	10.0
750.00	1395	2034	2673	3312	3951	4590	5229
800.00	1595	2284	2973	3662	4351	5040	5729
850.00	1795	2534	3273	4012	4751	5490	6229
900.00	1995	2784	3573	4362	5151	5940	6729
950.00	2195	3034	3873	4712	5551	6390	7229
1000.00	2395	3284	4173	5062	5951	6840	7729
1050.00	2595	3534	4473	5412	6351	7290	8229

NET RETURNS PER ACRE ABOVE CASH COSTS FOR WINE GRAPE

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Wine Grape	4.0	5.0	6.0	7.0	8.0	9.0	10.0
750.00	792	1431	2070	2709	3348	3987	4626
800.00	992	1681	2370	3059	3748	4437	5126
850.00	1192	1931	2670	3409	4148	4887	5626
900.00	1392	2181	2970	3759	4548	5337	6126
950.00	1592	2431	3270	4109	4948	5787	6626
1000.00	1792	2681	3570	4459	5348	6237	7126
1050.00	1992	2931	3870	4809	5748	6687	7626

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR WINE GRAPE

PRICE (DOLLARS/TON)	YIELD (TON/ACRE)						
Wine Grape	4.0	5.0	6.0	7.0	8.0	9.0	10.0
750.00	-1314	-675	-36	603	1242	1881	2521
800.00	-1114	-425	264	953	1642	2331	3021
850.00	-914	-175	564	1303	2042	2781	3521
900.00	-714	75	864	1653	2442	3231	4021
950.00	-514	325	1164	2003	2842	3681	4521
1000.00	-314	575	1464	2353	3242	4131	5021
1050.00	-114	825	1764	2703	3642	4581	5521

Table 8. COSTS AND RETURNS/BREAKEVEN ANALYSIS
LAKE COUNTY - 1998
SAUVIGNON BLANC

COSTS AND RETURNS - PER ACRE BASIS

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Wine Grapes	6300	1938	4362	2541	3759	4647	1653

COSTS AND RETURNS - TOTAL ACREAGE

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Wine Grapes	220500	67837	152663	88947	131553	162630	57870

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	Breakeven Price To Cover Operating Costs	Breakeven Price To Cover Cash Costs	Breakeven Price To Cover Total Costs
			$ per Yield Unit		
Wine Grapes	7.0	Ton	276.88	363.05	663.80

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price ($/Unit)	Breakeven Yield To Cover Operating Costs	Breakeven Yield To Cover Cash Costs	Breakeven Yield To Cover Total Costs
			Yield Units / Acre		
Wine Grapes	Ton	900.00	2.2	2.8	5.2