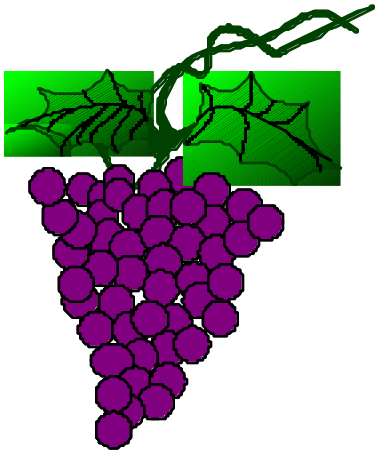
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2000

SAMPLE COSTS TO PRODUCE
WINE GRAPES



SIERRA NEVADA FOOTHILLS

Zinfandel Variety - 5 acre vineyard

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INTRODUCTION

The sample costs to produces wine grapes in the Sierra Nevada foothills are presented in this study. The hypothetical farm used in this report consists of a total of 20 acres, 5 are in wine grapes and the other 15 acres are in forest, roads, farmstead, and/or other vine or tree crops.

This study is intended as a guide only, and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans. The practices described in this cost study are considered typical for this crop and area. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to your situation. The use of trade names is not an endorsement or a recommendation. A "Your Cost" column in Tables 1 and 2.

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For an explanation of the calculations used in the study refer to the Assumptions, call the Department of Agricultural and Resource Economics, Cooperative Extension, University of California, Davis, California, (530) 752-3589 or call the Amador or El Dorado County farm advisors.

This and other cost of production studies can be ordered from the Department of Agricultural and Resource Economics, UC Davis, downloaded from their website (www. agecon.ucdavis.edu) or from selected county Cooperative Extension offices.

ASSUMPTIONS

The following assumptions pertain to sample costs to produce wine grapes in the Sierra Nevada foothills. Practices described should not be considered recommendations by the University of California, but rather represent production procedures considered typical for this crop and area. Some of these costs and practices may not be applicable to your situation nor used during every production year. Additional ones not indicated may be needed. Establishment and cultural practices for the production of wine grapes can vary significantly amongst growers and regions. The practices and inputs used in this cost study serve only as a sample or guide. The costs are presented 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 the Sierra Nevada foothills on previously unfarmed land. The farm is comprised of 20 acres, five of which are planted to wine grapes. The other 15 acres are occupied by forest, roads, irrigation systems, fencing, farmstead and/or other vine or tree crops. Land is valued at $10,000 per acre. This study assumes that the land was purchased primarily for a homesite and the vineyard was planted on the unused acres.

Vines. Zinfandel vines were planted during the spring on a 7' x 10' spacing with 622 vines per acre. In the second year 5% or 31 vines per acre were replanted for those lost in the first year. Vines were trained up a five foot T-post during the second and third years. The grapevines begin yielding fruit in the third year and were expected to be productive for an additional 22 years.

Trellis System. The trellis system is a five foot metal T-post at each vine to provide support during training. Installation of the trellis system is done by the owner and hired labor in the first year. The trellis system is considered part of the vineyard, since it would be removed at the time of vine removal, and is included in the vineyard establishment costs.

Irrigation System. Since the vineyard is established on raw forest land, water is purchased from the local irrigation district. A booster pump, and filtration station were installed along with the drip lines prior to planting. The five horsepower booster pump, filtration station, sprinkler lines, and the labor to install these components is included in the irrigation system cost. The irrigation system is considered an improvement to the property and has a 25 year lifespan. It is shown in the non-cash overhead sections as a capital recovery cost in the various tables and the investments portion of Table 4.

Production Cultural Practices

Pruning and Retying. Pruning is done during the winter months. The prunings are placed in the row middles and chopped with a flail mower. Vines are retied every three years, therefore, one-third of the cost of retying is shown each year in the production costs.

Irrigation. The delivered cost of the water from the district is $42.00 per acre foot or $3.50 per acre inch. No assumption is made about effective rainfall. Irrigations occur from June through August. In this study one acre foot (12 acre inches) is applied.

Pest Management. 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 the Sierra Nevada foothills viticulture farm advisors.

Weeds. Herbicide choice is a function of weed pressure which can change over time. In this study, vine row weeds are controlled with a pre-emergent herbicide applied as a strip spray during February. Resident vegetation in the row centers is mowed three times during the season.

Insects And Arthropods Pest populations are monitored to determine when an economically damaging level will occur and which control method to use. Different species of leafhoppers, June beetles, grasshoppers, and cutworms may cause problems, but are controlled by a ground application of an insecticide in June. A miticide application is made in July to control williamette mite.

Diseases. There are many pathogens that attack grapevines, but the only major disease that is assumed in this study is powdery mildew. Powdery mildew is treated beginning in April with a ground application of wettable sulfur. This is followed by five additional sulfur applications through August.

Harvest. In this cost study the grower contracts to have the grape crop hand harvested. Harvesting starts in the third year. The grower is charged on a per acre basis because of the small tonnage. The contract harvest rate after the first harvest is $100 per ton. It is assumed in this study that the grower owns 30 half-ton bins and rents a forklift during harvest. Hauling to the crusher is contracted and paid by the grower. It is assumed that the grower is hauling to a local winery and the cost would be approximately $30 per ton.

Yields. Yield maturity is reached in the fifth year. An assumed yield of 4 tons per acre is used to calculate cost per ton in the production years. The annual yields are measured in tons as shown in Table B.

Table B. Annual Yields for Zinfandel Grapes

Year:	3	4	5+
Tons Per Acre:	0.5	2.0	4.0

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 five years is $310 per ton while the high was $2,000. The five year average price for Zinfandel is $807 per ton. The yields and returns in this study are an estimate based on variety, fruit quality, and current market. An estimated price of $820 per ton for Zinfandel wine grapes has been established.

Table C Prices Per Ton Received by Sierra Foothill (District 10) Growers for Zinfandel Grapes [1]

	Range ($/ton)		Weighted $/ton
Year	Low	High	Average
1995	$450	$1,300	$675
1996	$450	$1,400	$808
1997	$310	$2,000	$805
1998	$350	$2,000	$813
1999	$350	$2,000	$936
Average	$382	$1,740	$807

[1] Data compiled from the Final Grape Crush Report, 1995-1998 Crops. Preliminary Grape Crush Report, 1999.

Labor. Hourly wages for workers are $9.00 and $6.00 per hour for machine and non-machine workers, respectively. Adding 34% for the employers share of federal and state payroll taxes, insurance, and other benefits gives the labor rates shown of $12.06 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 1 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. Returns above total costs are considered a return to management and risk.

Risk. Risk is caused by various sources of uncertainty including fluctuations in production, price, and interest. The risks associated with producing wine grapes in the Sierra Nevada foothills should not be underestimated. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent agronomic, market, and financial risks which affect the profitability and economic viability of wine grape production. In addition, establishment of vineyards and the equipment required to operate the vineyard is capital intensive. Growers should consider all of the agronomic and economic risks before committing resources to establishing a vineyard and wine grape production in this region.

Overhead Costs

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 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 10.71% 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 0.723% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $367 for the entire farm.

Office Expense. Office and business expenses for the five acres are estimated at $1,500 annually or $300 per 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 the Sierra Nevada foothills 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 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. The calculation for the annual capital recovery costs is as follows.

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

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (e.g., 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 wearout 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 equal to the purchase price because land does not depreciate. 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 one. It is the function of the interest rate and years of life of the equipment.

Interest Rate. The interest rate of 7.08% 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 Costs. The establishment cost is the sum of the costs for land preparation, trellis system, planting, vines, cash overhead, and production expenses for growing 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 in the third year represents the establishment cost. For this study, the estimated cost derived from establishment figures provided by the farm advisor is $11,903 per acre or $59,517 for the five acre vineyard. The cost is amortized over the remaining 22 years of vineyard production to estimate the annual capital recovery cost.

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

In allocating the equipment costs on a per acre basis, the following hourly charges are calculated first and shown in Table 5. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (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 1 is determined by multiplying the total hourly operating cost in Table 5 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 $1.09 and $1.49 per gallon, respectively.

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

Acknowledgment. Appreciation is expressed to those growers and other cooperators who provided support.

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Table 1.

UC COOPERATIVE EXTENSION
COSTS PER ACRE TO PRODUCE WINE GRAPES
SIERRA NEVADA FOOTHILLS - 2000
Five Acre Vineyard

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre: Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Cultural:							
Prune - Dormant	20.00	161	0	0	0	161	
Weed Control - Strip Spray	0.25	4	1	7	0	11	
Retie Vines - Every 3 Years	3.33	27	0	5	0	32	
Weed Control - Mow Middles 2X	0.72	10	3	0	0	14	
Disease Control - Mildew 6X	2.75	40	15	25	0	80	
Pest Control - Gophers 1X	0.20	3	1	10	5	19	
Irrigate	0.75	6	0	42	0	48	
Insect Control - Various Insects	0.46	7	2	24	0	33	
Crop Thinning	20.00	161	0	0	0	161	
Insect Control - Mites	0.57	8	4	36	0	48	
Pickup Truck Use	20.00	289	88	0	0	377	
TOTAL CULTURAL COSTS	68.92	714	113	149	5	980	
Harvest:							
Harvest - Contract	4.00	58	14	0	492	564	
Haul To Winery - Contract	0.00	0	0	0	120	120	
TOTAL HARVEST COSTS	4.00	58	14	0	612	684	
Interest on operating capital @ 10.71%						45	
TOTAL OPERATING COSTS/ACRE		772	127	149	617	1,710	
CASH OVERHEAD:							
Office Expense						300	
Liability Insurance						73	
Property Taxes						187	
Property Insurance						135	
Investment Repairs						212	
TOTAL CASH OVERHEAD COSTS						907	
TOTAL CASH COSTS/ACRE						2,617	
NON-CASH OVERHEAD:							
Investment		Per producing Acre		Annual Cost Capital Recovery			
Land		10,000		708		708	
Fence - 10'		2,801		242		242	
Drip System		2,980		258		258	
Buildings		1,950		158		158	
Shop Tools		400		43		43	
Vineyard Establishment		11,903		1,083		1,083	
1/2 Ton Bins-30		510		43		43	
Equipment		8,747		1,063		804	
TOTAL NON-CASH OVERHEAD COSTS		39,291		3,598		3,339	
TOTAL COSTS/ACRE						5,956	

Table 2. UC COOPERATIVE EXTENSION

COSTS AND RETURNS PER ACRE TO PRODUCE WINE GRAPE

SIERRA NEVADA FOOTHILLS - 2000

Five Acre Vineyard

	Quantity Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Wine Grape	4.00	ton	820	3,280	
OPERATING COSTS					
Herbicide:					
Goal 2XL	0.23	pint	15.01	3	
Roundup Ultra	0.60	pint	5.68	3	
Miscellaneous:					
Green Tape - 1"	622.00	foot	0.01	5	
Fungicide:					
Sulfur DF	30.00	lb	0.85	25	
Rent:					
Bait Machine	1.00	acre	5.30	5	
Forklift - Rental	0.40	week	230.00	92	
Rodenticide:					
Rodent Bait	5.00	lb	2.00	10	
Water:					
Water-Irrigation District	12.00	acin	3.50	42	
Insecticide:					
M-Pede	12.00	pint	1.96	24	
Miticide:					
Omite 30W	5.00	lb	7.15	36	
Contract:					
Harvest	4.00	ton	100.00	400	
Hauling	4.00	ton	30.00	120	
Labor (machine)	34.60	hrs	12.06	417	
Labor (non-machine)	44.08	hrs	8.04	354	
Fuel - Gas	37.45	gal	1.49	56	
Fuel - Diesel	20.06	gal	1.09	22	
Lube				12	
Machinery repair				37	
Interest on operating capital @ 10.71%				45	
TOTAL OPERATING COSTS/ACRE				1,710	
NET RETURNS ABOVE OPERATING COSTS				1,570	
CASH OVERHEAD COSTS:					
Office Expense				300	
Liability Insurance				73	
Property Taxes				187	
Property Insurance				135	
Investment Repairs				212	
TOTAL CASH OVERHEAD COSTS/ACRE				907	
TOTAL CASH COSTS/ACRE				2,617	

Table 2. Continued

NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY)	
Land	708
Fence - 10'	242
Drip System	258
Buildings	158
Shop Tools	43
Vineyard Establishment Cost	1,083
1/2 Ton Bins-30	43
Equipment	804
TOTAL NON-CASH OVERHEAD COSTS/ACRE	3,339
TOTAL COSTS/ACRE	5,956
NET RETURNS ABOVE TOTAL COSTS	-2,676

Table 3. U .C. COOPERATIVE EXTENSION

MONTHLY CASH COSTS PER ACRE TO PRODUCE WINE GRAPES

SIERRA NEVADA FOOTHILLS - 2000

Five Acre Vineyard

Beginning JAN 00 Ending DEC 00	JAN 00	FEB 00	MAR 00	APR 00	MAY 00	JUN 00	JUL 00	AUG 00	SEP 00	OCT 00	NOV 00	DEC 00	TOTAL
Cultural:													
Prune - Dormant		161											161
Weed Control - Strip Spray		11											11
Retie Vines - Every 3 Years			32										32
Weed Control - Mow Middle				7		7							14
Disease Control - Mildew				13	27	27	13						80
Pest Control - Gophers 1X					19								19
Irrigate 3X						16	16	16					48
Insect Control - Various						33							33
Crop Thinning						161							161
Insect Control - Mites							45						45
Pickup Truck Use	31	31	31	31	31	31	31	31	31	31	31	31	377
TOTAL CULTURAL COSTS	31	204	63	52	77	275	106	47	31	31	31	31	980
Harvest:													
Harvest - Contract									564				564
Haul To Winery - Contract									120				120
TOTAL HARVEST COSTS									684				684
Interest on oper. capital	0	2	3	3	4	6	7	8	14	0	-1	-1	45
TOTAL OPERATING COSTS/ACRE	32	206	66	55	81	281	113	55	729	31	31	31	1,710
OVERHEAD:													
Office Expense	25	25	25	25	25	25	25	25	25	25	25	25	300
Liability Insurance	73												73
Property Taxes	93						93						187
Property Insurance	68						68						135
Investment Repairs	18	18	18	18	18	18	18	18	18	18	18	18	212
TOTAL CASH OVERHEAD COSTS	277	43	43	43	43	43	204	43	43	43	43	43	907
TOTAL CASH COSTS/ACRE	309	248	108	97	123	323	316	98	772	74	74	73	2,617

Table 4. UC COOPERATIVE EXTENSION

WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS

SIERRA NEVADA FOOTHILLS - 2000

Five Acre Vineyard

ANNUAL EQUIPMENT COSTS

						Cash Overhead		
Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Total
00	3 Point Forks	592	15	57	63	2	3	69
00	42 HP 4WD Tractor	27,370	16	4,902	2,738	117	161	3,016
00	Mower - Flail 5'	4,248	20	221	398	16	22	437
00	Orch Sprayer 300 G	13,956	10	2,468	1,816	59	82	1,958
00	Pickup Truck 1/2 T	19,380	7	3,457	3,208	83	114	3,404
00	Weed Sprayer 100 G	2,408	10	7,352	-186	35	49	-102
	TOTAL	67,954		18,457	8,037	312	432	8,782
50	% of New Cost *	33,977		9,228	4,019	156	216	4,391

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

ANNUAL INVESTMENT COSTS

					Cash Overhead			
Description	Price	Yrs Life	Salvage Value	Capital Recovery	Insur-ance	Taxes	Repairs	Total
INVESTMENT								
1/2 Ton Bins-30	2,550	25	250	216	10	14	50	291
Buildings	9,750	30		792	35	49	195	1,071
Drip System	14,900	25		1,288	54	74	298	1,714
Fence - 10'	14,003	25		1,210	51	70	490	1,821
Land - 5 Acres	50,000	30	50,000	3,540	362	500	0	4,401
Shop Tools	2,000	15	150	215	8	11	25	258
Vineyard Establishment	59,517	22		5,416	0	0	0	5,416
TOTAL INVESTMENT	152,720		50,400	12,678	519	718	1,058	14,973

ANNUAL BUSINESS OVERHEAD

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	20	acre	18	367
Office Expense	5	acre	300	1,500

Table 5.

UC COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
SIERRA NEVADA FOOTHILLS - 2000
Five Acre Vineyard

			COSTS PER HOUR						
		Actual		Cash Overhead		Operating			
Yr	Description	Hours Used	Capital Recovery	Insurance	Taxes	Repairs	Fuel & Lube	Total Operate	Total Costs/Hr.
00	3 Point Forks	20.00	1.58	0.06	0.08	0.07	0.00	0.07	1.79
00	42 HP 4WD Tractor	48.60	28.16	1.20	1.66	0.54	2.59	3.13	34.15
00	Mower - Flail 5'	3.60	54.99	2.23	3.09	1.31	0.00	1.31	61.62
00	Orch Sprayer 300 G	18.30	49.57	1.62	2.24	1.95	0.00	1.95	55.39
00	Pickup 1/2 T	100.00	13.79	0.49	0.67	1.18	3.21	4.39	19.33
00	Weed Sprayer 100 G	1.30	125.36	4.10	5.67	0.53	0.00	0.53	135.66

Table 6. UC COOPERATIVE EXTENSION
RANGING ANALYSIS
SIERRA NEVADA FOOTHILLS - 2000
Five acre vineyard

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE WINE GRAPE

	YIELD (TON/ACRE)						
	2.80	3.20	3.60	4.00	4.40	4.80	5.20
OPERATING COSTS/ACRE:							
Cultural Cost	980	980	980	980	980	980	980
Harvest Cost	479	547	616	684	752	821	889
Interest on operating capital	44	44	45	45	46	47	47
TOTAL OPERATING COSTS/ACRE	1,503	1,572	1,641	1,710	1,779	1,848	1,917
TOTAL OPERATING COSTS/TON	537	491	456	427	404	385	369
CASH OVERHEAD COSTS/ACRE	907	907	907	907	907	907	907
TOTAL CASH COSTS/ACRE	2,410	2,479	2,548	2,617	2,686	2,755	2,824
TOTAL CASH COSTS/TON	861	775	708	654	610	574	543
NON-CASH OVERHEAD COSTS/ACRE	3,339	3,339	3,339	3,339	3,339	3,339	3,339
TOTAL COSTS/ACRE	5,749	5,818	5,887	5,956	6,025	6,094	6,163
TOTAL COSTS/TON	2,053	1,818	1,635	1,489	1,369	1,270	1,185

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR WINE GRAPE

PRICE	YIELD (TON/ACRE)						
(DOLLARS/TON)	2.8	3.2	3.6	4.0	4.4	4.8	5.2
574	104	265	426	586	747	907	1,068
656	334	527	721	914	1,108	1,301	1,494
738	564	790	1,016	1,242	1,468	1,695	1,921
820	793	1,052	1,311	1,570	1,829	2,088	2,347
902	1,023	1,315	1,606	1,898	2,190	2,482	2,774
984	1,252	1,577	1,902	2,226	2,551	2,875	3,200
1,066	1,482	1,839	2,197	2,554	2,912	3,269	3,626

NET RETURNS PER ACRE ABOVE CASH COSTS FOR WINE GRAPE

PRICE	YIELD (TON/ACRE)						
(DOLLARS/TON)	2.8	3.2	3.6	4.0	4.4	4.8	5.2
574	-802	-642	-481	-321	-160	1	161
656	-573	-379	-186	7	201	394	588
738	-343	-117	109	335	562	788	1,014
820	-114	145	404	663	922	1,181	1,440
902	116	408	700	991	1,283	1,575	1,867
984	346	670	995	1,319	1,644	1,969	2,293
1,066	575	933	1,290	1,647	2,005	2,362	2,720

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR WINE GRAPE

PRICE	YIELD (TON/ACRE)						
(DOLLARS/TON)	2.8	3.2	3.6	4.0	4.4	4.8	5.2
574	-4,142	-3,981	-3,821	-3,660	-3,499	-3,339	-3,178
656	-3,912	-3,719	-3,525	-3,332	-3,139	-2,945	-2,752
738	-3,683	-3,456	-3,230	-3,004	-2,778	-2,552	-2,325
820	-3,453	-3,194	-2,935	-2,676	-2,417	-2,158	-1,899
902	-3,223	-2,932	-2,640	-2,348	-2,056	-1,764	-1,473
984	-2,994	-2,669	-2,345	-2,020	-1,695	-1,371	-1,046
1,066	-2,764	-2,407	-2,049	-1,692	-1,335	-977	-620