



**1989**

**Sample Cost To Establish And Produce Wine Grapes In**

***Napa Valley***

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1989  
SAMPLE COSTS TO ESTABLISH AND PRODUCE  
WINE GRAPES IN THE NAPA VALLEY

by

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This cost study provides detailed information on the sample costs to establish and produce wine grapes in the Napa Valley. For the purposes of this study we are considering a 40 acre parcel on the valley floor of which 36 acres are planted.

Costs and practices in this sample study are for a typical well-managed vineyard and are not intended to reflect an average of all vineyards in the Napa Valley. Sample costs given for labor, materials, equipment and contract services are based on 1989 figures. Some costs or practices included in this study may not be applicable to your situation. This study is intended only as a guide and can be used as an aid in making production decisions, determining potential returns, preparing budgets and evaluating production loans.

This study contains "General Assumptions for Establishing and Producing Wine Grapes" and seven tables.

- Table 1. "Sample Costs to Establish A Wine Grape Vineyard" shows sample costs to remove an old vineyard and establish a new one. Planting to full production takes four years.
- Table 2. "Sample Production Costs for a Mature Wine Grape Vineyard" shows the annual production costs on a per acre basis and includes a blank "Your Costs" column to enter your own production costs.
- Table 3. "Monthly Summary of Per Acre Cash Costs" is a monthly summary of the annual cash costs shown in Table 2.
- Table 4. "Equipment and Building List for a Wine Grape Vineyard".
- Table 5. "Cost to Produce Wine Grapes at Varying Prices and Yields".
- Table 6. "Per Acre Income Above Cash Costs at Varying Prices and Yields".
- Table 7. "Per Acre Income Above Total Costs at Varying Prices and Yields".

For an explanation of calculations used for the study refer to the attached "General Assumptions for Establishing and Producing Wine Grapes" or call Agricultural Economics Extension, University of California, Davis, California (916) 752-2745 or the Napa County Viticulture Farm Advisor.

The authors wish to thank the Napa Valley Grape Growers Association and Motto, Kryla and Fisher for their assistance in preparing this study.

# GENERAL ASSUMPTIONS FOR ESTABLISHING AND PRODUCING WINE GRAPES

Napa Valley - 1989

The following is a description of some general assumptions pertaining to the sample costs of establishing and producing wine grapes in the Napa Valley.

## 1. LAND:

Land is valued at \$27,000 per acre. Since only 36 of the 40 total acres are in production, the land value per vineyard acre is shown as \$30,000. The remaining four acres are for a shop, roads, staging area, etc. Land is not depreciated.

## 2. CONVERSION COSTS:

The existing vineyard will be removed following the land purchase. Conversion costs include vine removal, ripping, fumigation, and pre-plant tillage.

## 3. VINES:

Bench grafted vines are planted on a 7' X 11' spacing with 566 vines per acre. Vines will be cordon trained and spur pruned.

## 4. TRELLISING:

7-foot metal stakes are placed at every vine with 24-inch crossarms on every other stake. Five wires, including one to hold the drip lines, are strung between 8-foot lodge pole endposts. Stakes, endposts and two wires are installed during the first year of establishment with the crossarms and remaining wires installed during the second year.

## 5. IRRIGATION:

Water for the drip irrigation system is pumped from a depth of 200 feet in a 350 foot well using a 20 horsepower pump pressurized to 35 psi at the discharge head. Pumping costs are estimated at \$125 per acre foot. There are five irrigations of 10 gallons each from April through August with a post-harvest irrigation of 25 gallons in October for a total of 75 gallons per vine per year.

## 6. FROST PROTECTION:

Frost protection is provided by four 125 horsepower wind machines.

## 7. CULTURAL PRACTICES:

Weed control includes strip spraying of herbicides in the vine row with cultivation in the centers. A contact herbicide is used for spot weed control during the summer. Hand vine care includes training and tying during the establishment years, suckering trunks and cordons, and leaf removal around the clusters. Pest management includes a wettable sulfur application in the spring, sulfur dusting until bloom followed by three spray applications. Fertilization includes spring and summer applications under the emitters totaling 30 pounds of nitrogen per year.

## 8. HARVEST:

Harvest costs are based on custom or contract rates.

9. LABOR:

Hourly wages for workers are \$9.00 and \$7.50 per hour for skilled and field labor respectively. Adding 34% for SDI, FICA, insurance, and other benefits gives the labor rates shown of \$12.00 per hour for skilled labor and \$10.00 per hour for field labor. The labor hours for operations involving machinery are 10% higher than the machine hours to account for the extra labor involved in equipment set-up, moving, maintenance and repairs.

10. OVERHEAD:

County taxes are calculated as 1% of the land value plus 1% of the average value of vines, equipment, buildings and improvements. Insurance is charged at 0.8% of the average value of equipment over its useful life. Office and business costs are estimated at \$6,000 per year for the whole ranch and include office supplies, phone, bookkeeping, accounting, legal fees, etc.

11. INTEREST:

Interest on operating capital is based on cash costs and is calculated monthly until harvest at the rate of 12% per year. Interest is charged on accumulated cash costs in the establishment years to reflect interest costs for a long-term establishment loan. Interest is also charged on investment at 12% per year to account for income foregone that could be received from an alternative investment (opportunity cost) and is based on the value of the land plus the average value of the vines over the life of the vineyard, buildings and equipment.

12. EQUIPMENT COSTS:

Equipment costs are described in detail in Table 4. In allocating the equipment costs per acre, the following calculations were made: (a) "Original Cost" of equipment is the new cost including sales tax. (b) "Depreciation" is straight line with no salvage value. It is calculated by dividing new cost per acre by the years to trade. (c) "Interest" on investment is figured as one-half of the new cost per acre multiplied by the interest rate. One-half of the new cost is the average value of the equipment during its useful life. (d) The same investment cost per acre is used in Table 1, Table 2 and Table 4 and is calculated at 60% of the depreciation and interest costs for all new equipment to reflect a mix of new and used equipment.

13. FUEL & REPAIRS:

The fuel and repair cost for each operation in Table 2 is determined by multiplying the total hourly operating cost for each piece of equipment shown in Table 4 by the number of hours per acre for that operation. The equipment used for an operation is identified on Table 2 by the number listed in the "Tractor/Implement No." column which corresponds to the "Item Number" column on Table 4.

14. Pick-up truck operating costs are based on 8,000 miles/year of use at \$0.15/mile.

TABLE 1. SAMPLE COSTS TO ESTABLISH A WINE GRAPE VINEYARD  
Napa Valley - 1989

Costs are for a drip irrigated vineyard planted 7' X 11', with 566 vines/acre.

Labor Rate (incl. overhead): \$12.00/hour skilled Interest rate: 12%  
\$10.00/hour field

YEAR	Costs per Vineyard Acre			
	1st	2nd	3rd	4th
YIELD (Tons/acre)			2.0	4.0
<b>Planting costs</b>				
Vine removal and ripping - contract	\$425			
Fumigation - contract	1,200			
Pre-plant tillage - tractor & disc 3 hrs.	61			
Layout and mark - 12 hours labor	120			
Trellis installation (stakes, endposts, wires, crossarms, clips and labor)	1,130	501		
Trim and store vines - 10 hours labor	100	2		
Plant vines - 566 vines @ \$3 + 25 hrs labor	1,948	39	10	
<b>TOTAL PLANTING COSTS</b>	<b>\$4,984</b>	<b>\$542</b>	<b>\$10</b>	
<b>Cultural costs:</b>				
Pruning	\$70	\$130	\$200	\$240
Chop Brush	11	11	11	11
Winter weed control	30	30	30	30
Summer weed control	15	15	15	15
Hand vine care	200	250	250	300
Cultivation 4X	41	41	41	41
Frost protection	37	37	37	37
Dusting	0	23	23	23
Pest management	0	27	108	108
Irrigation	36	36	36	36
Labor	47	47	47	47
Fertilize	55	55	55	55
Costs for pick up truck	33	33	33	33
<b>TOTAL CULTURAL COSTS</b>	<b>\$576</b>	<b>\$736</b>	<b>\$887</b>	<b>\$977</b>
<b>Harvest Costs:</b>				
Custom harvest @ \$120/ton			240	480
<b>TOTAL HARVEST COSTS</b>			<b>\$240</b>	<b>\$480</b>
<b>Overhead Costs:</b>				
Office and business costs	167	167	167	167
County Taxes	318	318	318	318
Insurance	42	42	42	42
<b>TOTAL OVERHEAD COSTS</b>	<b>\$527</b>	<b>\$527</b>	<b>\$527</b>	<b>\$527</b>
<b>TOTAL CASH COSTS</b>	<b>\$6,087</b>	<b>\$1,805</b>	<b>\$1,663</b>	<b>\$1,984</b>
<b>ACCUMULATED CASH COSTS</b>	<b>\$6,087</b>	<b>\$7,892</b>	<b>\$9,555</b>	<b>\$11,539</b>

TABLE 1. continued

YEAR	Costs per Vineyard Acre			
	1st	2nd	3rd	4th
Depreciation:				
Buildings, equipment and irrigation system*	231	231	231	231
TOTAL DEPRECIATION	\$231	\$231	\$231	\$231
Interest on Investment				
Buildings, equipment and irrigation system*	217	217	217	217
Land \$30,000 per vineyard acre	3,600	3,600	3,600	3,600
Interest on accumulated cash costs	730	947	1,147	1,385
TOTAL INTEREST ON INVESTMENT	\$4,548	\$4,764	\$4,964	\$5,202
TOTAL COST FOR THE YEAR	\$10,866	\$6,800	\$6,858	\$7,416
CREDIT FROM HARVEST @ \$1,400/TON			\$2,800	\$5,600
NET COST FOR THE YEAR	\$10,866	\$6,800	\$4,058	\$1,816
TOTAL ACCUMULATED NET COST	\$10,866	\$17,665	\$21,723	\$23,539

\* From Table 4, "Building and Equipment List for a Wine Grape Vineyard".

TABLE 2. SAMPLE PRODUCTION COSTS FOR A MATURE WINE GRAPE VINEYARD  
Napa Valley - 1989

Labor Rate (incl. overhead): \$12.00/hr. skilled labor Interest Rate: 12%  
\$10.00/hr. field labor Yield (tons/acre): 5.0

Operation	-- Equipment Used* --			----- Per Acre Costs -----					Your Cost	
	Implement No.	Implement No.	Hours/A	Labor	Fuel & Repairs	Material	Contract Service	Total Cost		
Cultural costs:										
Pruning			24.0	\$240.00					\$240	
Chop Brush	1	3	.5	6.60	\$3.94				11	
Winter weed control	1	5	.3	4.36	2.05	\$24.00			30	
Summer weed control	1	5	.3	5.80	1.55	8.00			15	
Hand vine care			30.0	300.00					300	
Cultivation 4X	1	2	2.0	26.40	14.56				41	
Frost protection			7	10.00	27.22				37	
Dusting 4X	1	4	.8	10.56	4.54	7.75			23	
Pest management 4X	1	6	2.0	26.40	14.56	67.00			108	
Irrigation	8	9			20.00	15.63			36	
Labor		10	4.0	40.00	7.46				47	
Fertilize 2X			3.0	30.00		25.00			55	
Costs for pick up truck					33.33				33	
Interest on operating capital @ 12%									80	
TOTAL CULTURAL COSTS			68	\$700	\$129	\$147		\$1,056		
Contract harvest @ \$120 per ton							\$600	\$600		
TOTAL HARVEST COSTS							\$600	\$600		
Cash overhead:										
Office and business costs								\$167		
County Taxes								376		
Insurance								42		
TOTAL CASH OVERHEAD COSTS								\$585		
TOTAL CASH COSTS								\$2,241		
TOTAL CASH COST/TON: 5 tons/acre yield								\$448		
-----										
Investment	Per vineyard		----- Annual Cost -----							
	Acres		Depreciation			Interest @ 12%				
Land (bare)	\$ 30,000					\$3,600		\$3,600		
Equipment & buildings*	3,622		\$231			217		448		
Vineyard (20 yr. depreciation)**	23,539		1,177			1,412		2,589		
TOTAL INVESTMENT COSTS							\$ 57,161	\$1,407	\$5,230	\$6,637
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TOTAL COSTS PER ACRE								\$8,878		
TOTAL COST/TON: 5 tons/acre yield								\$1,776		

\* From Table 4, "Equipment and Building List for A Wine Grape Vineyard".

\*\* From Table 1, "Sample Costs to Establish A Wine Grape Vineyard".

TABLE 3. MONTHLY SUMMARY OF PER ACRE CASH COSTS FOR A MATURE WINE GRAPE VINEYARD

Napa Valley - 1989

Operation	Dollars per Vineyard Acre (Rounded)												TOTAL	
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov		
Cultural costs:														
Pruning		120	120											\$240
Chop Brush			11											11
Winter weed control	30													30
Summer weed control						5	5	5						15
Hand vine care					50	100	100	50						300
Cultivation 4X					10	10	10	10						41
Frost protection				19	19									37
Dusting 4X					11	11								23
Pest management 4X					27	27	54							108
Irrigation					5	5	5	5	5		12			36
Labor					8	8	8	8	8		8			47
Fertilize 2X					28			28						55
Pick-up truck costs	3	3	3	3	3	3	3	3	3	3	3	3		33
Interest on operating capital @ 12%		2	3	3	5	7	8	10	10	16	16			80
<b>TOTAL CULTURAL COSTS</b>	<b>\$34</b>	<b>\$124</b>	<b>\$136</b>	<b>\$25</b>	<b>\$165</b>	<b>\$176</b>	<b>\$193</b>	<b>\$118</b>	<b>\$25</b>	<b>\$19</b>	<b>\$39</b>	<b>\$3</b>		<b>\$1,056</b>
Contract harvest														
													600	600
<b>TOTAL HARVEST COSTS</b>										<b>\$600</b>				<b>\$600</b>
Cash overhead:														
Office and business	14	14	14	14	14	14	14	14	14	14	14	14	14	167
County Taxes	188				188									376
Insurance	4	4	4	4	4	4	4	4	4	4	4	4	4	42
<b>TOTAL CASH OVERHEAD</b>	<b>\$205</b>	<b>\$17</b>	<b>\$17</b>	<b>\$17</b>	<b>\$205</b>	<b>\$17</b>	<b>\$17</b>	<b>\$17</b>	<b>\$17</b>	<b>\$17</b>	<b>\$17</b>	<b>\$17</b>	<b>\$17</b>	<b>\$585</b>
<b>TOTAL CASH COSTS</b>	<b>\$239</b>	<b>\$142</b>	<b>\$154</b>	<b>\$42</b>	<b>\$370</b>	<b>\$193</b>	<b>\$211</b>	<b>\$135</b>	<b>\$43</b>	<b>\$636</b>	<b>\$56</b>	<b>\$20</b>		<b>\$2,241</b>



TABLE 4. EQUIPMENT AND BUILDING LIST FOR A WINE GRAPE VINEYARD  
Napa Valley - 1989

Interest Rate: 12% Fuel Cost per Gallon: \$.80 diesel  
\$.95 unleaded

ITEM #	DESCRIPTION	NEW COST	ANNUAL COST		LIFE* (HRS)	YEARS TO TRADE	----OVERHEAD*----		TAR*	--- HOURLY COSTS ---		
			USE (ACRES)	PER ACRE			DEPREC-	INTEREST*		FUEL*	REPAIRS*	TOTAL
1	50 HP 4WD diesel	\$22,000	36	\$611	12,000	15	\$40.74	\$36.67	120%	\$2.68	\$2.20	\$4.88
2	Disc, 8'	5,000	36	139	2,500	15	9.26	8.33	120		2.40	2.40
3	Chopper, 7'	5,000	36	139	2,000	10	13.89	8.33	120		3.00	3.00
4	Duster	2,000	36	56	2,000	10	5.56	3.33	80		.80	.80
5	Weed sprayer, 50 gal.	1,600	36	44	1,200	10	4.44	2.67	100		1.33	1.33
6	Air blast sprayer, 400 gal	6,000	36	167	2,000	10	16.67	10.00	80		2.40	2.40
7	Wind machines, 4 @ \$17,000	68,000	36	1,889		20	94.44	113.33				
8	Well, pump, filters, main.	25,000	36	694		20	34.72	41.67				
9	Drip irrigation system	36,000	36	1,000		20	50.00	60.00				
10	ATV 4WD	4,700	36	131		7	18.65	7.83				
11	Pick-up, 1/2 ton	14,000	36	389		7	55.56	23.33				
12	Misc. tools and equipment	10,000	36	278		10	27.78	16.67				
	Shop building	18,000	36	500		40	12.50	30.00				
TOTAL COST		\$217,300		\$6,036			\$384	\$362				
60% OF NEW COSTS*		\$130,380		\$3,622			\$231	\$217				

\* DEFINITIONS:

LIFE IN HOURS----- Derived from the "American Society of Agricultural Engineers Yearbook of Standards".  
YEARS TO TRADE----- The projected life of the machine in years adjusted for excessive annual use.  
OVERHEAD ----- Per acre per year.  
DEPRECIATION ----- "COST PER ACRE" divided by "YEARS TO TRADE"  
INTEREST----- ("COST PER ACRE" X "INTEREST RATE") divided by 2 = average interest cost per acre per year.  
TAR----- Total accumulated repairs. The total cost of repairs during the machine's life expressed as a percent of "NEW COST". Calculated from equations based on equipment type and annual use.  
HOURLY COST OF FUEL----- Diesel fuel, oil and lube costs per hour = HP x cost of diesel fuel/gal X 0.0667.  
Gasoline fuel, oil and lube costs per hour = HP x cost of gasoline/gal X 0.0889.  
HOURLY COST OF REPAIRS-- ("NEW COST" X "TAR") divided by ("LIFE IN HOURS").  
60% OF NEW COSTS ----- Used to reflect a mix of new and used equipment.

TABLE 5. COST TO PRODUCE WINE GRAPES AT VARYING PRICES AND YIELDS  
Napa Valley - 1989

	YIELD (Tons/acre)						
	3.0	4.0	5.0	6.0	7.0	8.0	9.0
Cultural Costs	1,056	1,056	1,056	1,056	1,056	1,056	1,056
Harvest Costs	360	480	600	720	840	960	1,080
Cash Overhead	585	585	585	585	585	585	585
Cash cost/acre	2,001	2,121	2,241	2,361	2,481	2,601	2,721
Cash cost/ton	667	530	448	393	354	325	302
Investment cost	6,637	6,637	6,637	6,637	6,637	6,637	6,637
TOTAL COST/ACRE	8,638	8,758	8,878	8,998	9,118	9,238	9,358
TOTAL COST/TON	2,879	2,190	1,776	1,500	1,303	1,155	1,040

TABLE 6. PER ACRE INCOME ABOVE CASH COSTS AT VARYING PRICES AND YIELDS

PRICE (Dollars per Ton)	YIELD (Tons/acre)						
	3.0	4.0	5.0	6.0	7.0	8.0	9.0
1,000	999	1,879	2,759	3,639	4,519	5,399	6,279
1,200	1,599	2,679	3,759	4,839	5,919	6,999	8,079
1,400	2,199	3,479	4,759	6,039	7,319	8,599	9,879
1,600	2,799	4,279	5,759	7,239	8,719	10,199	11,679
1,800	3,399	5,079	6,759	8,439	10,119	11,799	13,479
2,000	3,999	5,879	7,759	9,639	11,519	13,399	15,279
2,200	4,599	6,679	8,759	10,839	12,919	14,999	17,079

TABLE 7. PER ACRE INCOME ABOVE TOTAL COSTS AT VARYING PRICES AND YIELDS

PRICE (Dollars per Ton)	YIELD (Tons/acre)						
	3.0	4.0	5.0	6.0	7.0	8.0	9.0
1,000	-5,638	-4,758	-3,878	-2,998	-2,118	-1,238	-358
1,200	-5,038	-3,958	-2,878	-1,798	-718	362	1,442
1,400	-4,438	-3,158	-1,878	-598	682	1,962	3,242
1,600	-3,838	-2,358	-878	602	2,082	3,562	5,042
1,800	-3,238	-1,558	122	1,802	3,482	5,162	6,842
2,000	-2,638	-758	1,122	3,002	4,882	6,762	8,642
2,200	-2,038	42	2,122	4,202	6,282	8,362	10,442