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SAMPLE COSTS TO PRODUCE WINE GRAPES AND TO ESTABLISH A WINERY IN CALAVERAS COUNTY - 1992

This information was prepared for presentation at the 15th Annual Wine Grape Day held in Murhpys, Calaveras County, June 20, 1992.

SAMPLE COSTS TO PRODUCE WINE GRAPES AND TO ESTABLISH A WINERY IN CALAVERAS COUNTY - 1992

prepared by

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The sample costs for wine grape production and winery establishment in Calaveras County are presented in this study. The hypothetical vineyard used in this report consists of a total of 45 acres, 40 of which are in production each year. Land for the winery is not included.

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 blank "Your Costs" column is provided to enter your actual costs on Table 1: Costs per Acre to Produce Wine Grapes. This study is only intended as a guide and can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans. This study consists of "General Assumptions for Producing Wine Grapes", Tables 1-3 detailing costs associated with wine grape production, Table 4 showing net returns to growing wine grapes, "General Assumptions for Establishing a Winery" and Table 5 detailing costs of some aspects of establishing a winery.

For an explanation of calculations used for the study refer to the attached General Assumptions, call the Department of Agricultural Economics, Cooperative Extension, University of California, Davis, California, (916) 752-3589 or call the farm advisor in the county of interest.

General Assumptions for Producing Wine Grapes

The following is a description of some general assumptions pertaining to sample costs of wine grape production in Calaveras County. The costs are based on practices used by growers in this region, some of which may not be used during every production year. These costs are presented on an annual per acre basis.

1. Land: Land is valued at $2,000 per acre. The farm comprises 45 acres, 40 of which are planted with wine grapes. The other 5 acres are used for the farmstead, roads, well and storage buildings. Since only 40 of the 45 total acres are in production, the land value per vineyard acre is shown as $2,250. Land is not depreciated.

2. Establishment Costs: Establishment costs in Calaveras County have been estimated at between $8,000 and $10,000 per acre by growers in the area. These costs include plowing and other simple land preparation procedures, the cost of the vines and trellis system, installation of the trellis and irrigation systems, and deer fencing. Also included are the materials and labor needed for land preparation, planting and training of vines, irrigation, fertilizing, and pest and disease control during the establishment of the vineyard.

The vines currently under cultivation in Calaveras County are Cabernet Sauvignon, Chardonnay, and some Sauvignon Blanc and Merlot varieties. 538 vines are planted per acre and spaced 9' x 9'. The vines can be either bench grafts or rooted cuttings. The rooted cuttings are less expensive than the bench grafts.

The vines are trained using either the Bilateral Corden trellis system or the Geneva Double Curtain trellis system. The Bilateral Corden trained trellis system reflects the lower range of establishment costs and the Geneva Double Curtain the higher range.

The establishment costs are incurred during the first three to four years of the vineyard's life and are amortized throughout the life of the vineyard. The vineyard reaches full production after the 5th year and continues to produce wine grapes for another 20 years. The costs presented in Tables 1-3 reflect the cultivation costs once the vineyard has reached maturity.

Not included in the establishment costs are land clearing, filling, grading, chiseling and ripping due to the wide variability in need for and cost of these operations. Also not included is a reservoir or any other major water development costs (such as a deep well) needed to store or obtain water for irrigation, nor any equipment, if needed, for frost protection.

3. Labor Rates: (includes SDI, FICA, insurance and other benefits)

Machinery operators:	$8.00/hr
Irrigators & misc. labor:	$6.75/hr

To account for maintenance and repair time, labor hours for operations involving machinery are 10% higher than the machine hours.

4. Equipment Costs: 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 an adjustment for salvage value. It is calculated by dividing new cost per acre, less the salvage value, by the years to trade. (c) "Interest" on investment is figured as one-half of the new cost per acre plus salvage value multiplied by the interest rate. One-half of the new cost plus salvage value is the average value of the equipment during its useful life. (d) The investment per acre used in the cost study is calculated at 60% of the depreciation and interest costs for all new equipment to reflect a mix of new and used equipment.

5. Irrigation Assumptions: Once the vineyard is established there are 13 irrigations per year. The irrigations start in May and continue every 10 days through August. There is one additional post-harvest irrigation in October. Water for the drip irrigation system is pumped from a depth of 100 feet using a 10 horsepower pump pressurized to 30 psi at the discharge head. The irrigation system has a 20 year lifespan. Pumping costs for irrigation water are estimated at $33.72 per acre foot.

6. Cultural Practices: Fertilizer is applied at a rate of approximately 28 lbs per acre during the production years. Commercial fertilizer companies can make up many different mixes of fertilizers required for the vineyard. In this study a mix of NPK 6-3-9 is used and is injected through the drip irrigation system.

Pest and disease control includes: 2 sprayings a year for mites and grasshoppers, dusting 3 times a year with sulphur, and leaf removal from around the grape bunches once a year.

7. Overhead Costs: These costs include office and business costs (phone, office supplies, accounting fees, etc), county taxes, insurance and interest on operating capital.

County taxes are calculated at 1% of land at acquisition plus 1% of the average value of vines, equipment, buildings and improvements.

Insurance is for equipment (calculated as 0.5% of equipment costs) plus pick-up and liability insurance.

Interest for establishment costs is based on the accumulated cash costs from previous years pro-rated at 12%. Interest on operating capital is based on monthly cash costs pro-rated at 12%. Interest costs are not calculated after harvest.

8. Fuel & Repairs: The fuel and repair cost per acre for each operation in Table 1 is determined by multiplying the total hourly operating cost for each piece of equipment in Table 3 by the number of hours per acre for that operation. Prices for on-farm delivery of gasoline and diesel are $0.98 and $0.71 per gallon, respectively.

9. Management: The vineyard is assumed to be owner operated. The owner's salary is not charged as a cost in this study. The profit shown when vines reach production includes both return to management and return on investment.

General Assumptions for Establishing a Winery

The type of winery to establish depends on many factors. These factors can include the variety of grapes to be processed, the grapes' maturity dates, and what characteristics and qualities to give the wine during processing.

Two criteria were used to determine some of the costs and considerations of establishing a winery. The first was to evaluate the smallest technically feasible size for a winery. The second criteria involved identifying the smallest size of winery at which wine making usually becomes profitable.

Under the first criterion, the smallest technically feasible winery would process 50 tons of grapes or approximately 3,200 cases of wine*. This figure is based on the following: The minimum size fermentation tank which should be used is a 500 gallon stainless steel tank. At smaller sizes and with plastic or fiberglass tanks there are problems with must fermentation. Six tanks are used and each tank can be filled 4 times. However, if the variety of grapes being processed mature at the same time, additional tanks will be needed. With this quantity of grapes, a 2-ton destemmer and a 2-ton press can be used. However, the exact size and type, and the additional pieces of equipment needed would be chosen based on how the winemaker wishes to process the grapes and the must.

At a level of 3,200 cases a year, wineries are not very often profitable. Even if a winery this small can produce a wine below the price that wines of comparable quality are receiving from buyers, a bottleneck can sometimes occur in the marketing of the final product. Since small wineries often suffer from a lack of recognition among consumers, the costs and time involved to market and promote the wine can be significant. This is especially true for new wineries operating in regions not associated in the public mind as "wine growing country". Due to this problem, the smallest size winery which is conventionally considered to be profitable is one which produces 10,000 cases of wine per year.

Table 5 presents some representative costs of the main equipment used in wine making. Other costs to consider are land purchases at $2000/acre, materials, lab equipment for must and wine analysis, chemicals, additional cleaning and maintenance equipment, taxes, depreciation, salaries, utilities, construction of buildings, transportation and installation of equipment, and marketing and sales.

Sources of Data Reported

The following sources provided information on winery size, equipment and costs: Dr. Roger Boulton, Department of Viticulture and Enology, UC Davis; The Compleat Winery, Napa Valley; Associated Winery Systems, Napa Valley; Barrel Builders; and Santa Rosa Stainless Steel Fabricators.

* Calculated as (50 tons grapes x 150 gallons of juice per ton)/2.4 gallons juice per case.

TABLE 1

SAMPLE COSTS TO PRODUCE WINE GRAPES

Calaveras County - 1992

Labor Rate: $8.00/hr. skilled labor
$6.75/hr. field labor

Interest Rate: 12%

Yield (Tns/acre): 5.0

Operation	Tractor/ Impl No.*	Implement No.*	Hrs	Labor Cost/A	Fuel & Repairs	Material Cost	Custom/ /Rent	Total Cost	Your Cost
					--- Cash and Labor Costs per Acre ---				
Cultural Costs:									
Disc 2X	1	2	2	17.60	$12			$30	
Harrow	1	5	1.4	12.32	5			17	
Prune		6	11.0	74.25	4			78	
Fertilize - 40# N, Boron			.1	.88		44.24		45	
Irrigate	9		3.25	21.94	20	7.30		49	
Leaf Removal			27	182.25				182	
Miticide 2X	1	4	.6	5.28	2	22.28		30	
Dusting 3X	1	3	.9	7.92	4	5.75		18	
Herbicide strip spray	1	4	.33	2.90	1	53.48		58	
Costs for pick up truck		8	11.2	89.60	121			210	
TOTAL CULTURAL COSTS			58	$415	$169	$133		$717	
Harvest Costs:									
Custom Harvesting @$120/ton			120				600	$600	
TOTAL HARVEST COSTS			120				600	$600	
TOTAL HARVEST COSTS PER TON								$120	
Cash overhead:									
Office and business costs								$200	
County Taxes								138	
Equipment Insurance								46	
Interest on operating capital (from Table 2)								49	
TOTAL CASH OVERHEAD COSTS								$433	
TOTAL CASH COSTS								$1750	
TOTAL CASH COST PER TON								$350	

Investment	Per producing Acre	--- Annual Cost --- Depreciation	Interest @ 12%	
Land (bare)	$2250		$270	$270
Equipment & buildings*	2,643	$217	166	383
Vines (25 Year life)	10,000	400	600	1,000
TOTAL INVESTMENT COSTS	$ 14,893	$617	$1036	$1653
TOTAL COSTS PER ACRE				$3403
Cost per ton at yield	5tons/acre			$681

* See Table 5 for details on equipment.

TABLE 2

MONTHLY SUMMARY OF PER ACRE

SAMPLE COSTS TO PRODUCE WINE GRAPES

Calaveras County - 1992

Interest Rate: 12%

Operation	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL
Cultural Costs:													
Disc 2X			15	15									$30
Harrow				17									17
Prune	78												78
Fertilize - 40# N, B		45											45
Irrigate					11	11	11	11		4			49
Leaf Removal						182							182
Miticide 2X						15	15						30
Dusting 3X					6	6	6						18
Herbicide strip spray		58											58
Costs for pick up	18	18	18	18	18	18	18	18	18	18	18	18	210
TOTAL CULTURAL COSTS	$96	$120	$32	$50	$35	$232	$50	$29	$18	$21	$18	$18	$717
Harvest Costs:													
Custom Harvesting @120								600					600
TOTAL HARVEST COSTS								$600					600
Cash overhead:													
Office/business costs	17	17	17	17	17	17	17	17	17	17	17	17	200
County Taxes				69								69	138
Equipment Insurance	46												46
Int.-operating capital	2	3	3	5	5	8	8	15					49
TOTAL CASH OVERHEAD	$64	$20	$20	$91	$22	$24	$25	$32	$17	$17	$17	$86	$433
TOTAL CASH COSTS	$160	$140	$52	$140	$57	$256	$75	$660	$34	$38	$34	$103	$1750

TABLE 3

EQUIPMENT AND BUILDING LIST FOR WINE GRAPES*

Calaveras County - 1992

Interest Rate: 12% Fuel Cost per Gallon $.71 diesel

$.98 unleaded gasoline

ITEM #	DESCRIPTION	NEW COST	SALVAGE VALUE	ANNUAL USE (ACRES)	COST LIFE (HRS)	YEARS TO TRADE	----OVERHEAD---- DEPREC-IATION	INTEREST	ANNUAL USE (HRS)	TAR	--- HOURLY COSTS -- FUEL	REPAIRS	TOTAL
	Tractors:												
1	35 HP wheel diesel	19,365	$3770	40	10,000	15	25.99	34.70	225	18%	$1.66	$1.03	$2.70
2	Offset Disc 8' 6"	7,000	672	40	2,500	15	10.55	11.51	160	112		3.27	3.27
3	Duster	3035	537	40	2000	10	6.25	5.36	50	30		1.82	1.82
4	Weedsprayer	2,000	354	40	1,200	10	4.12	3.53	60	38		1.27	1.27
5	Springtooth 6'	1,850	178	40	2,500	15	2.79	3.04	140	94		.83	.83
6	Pruning Equipment	1,200	442	40		4	4.74	2.46	325	40		.37	.37
7	Shop Tools	10,000	1,000	40		15	15.00	16.50					
8	Pick-up, 1/2 ton	16,500	1,650	40	2,000	7	53.04	27.23	280	61	5.64	5.14	10.77
	SUBTOTAL	$60950					$122	$104					
	60% OF NEW COSTS*	$36570					$73	$63					
9	Drip Irrigation System	52,400		40		10	131.00	78.60	130	15		6.05	6.05
10	Buildings	15,750		40		35	11.25	23.63					
11	2 Fuel Tanks	$1,000.00		40		30	.83	1.50					
	TOTAL COST	$105720					$217	$166					

* DEFINITIONS:

YEARS TO TRADE --------- The projected life of the machine in years adjusted for excessive annual use.

OVERHEAD ---------- Per acre per year.

SALVAGE VALUE ---------- A machine's worth at the end of its useful life.

DEPRECIATION ---------- ("NEW COST" - "SALVAGE VALUE") divided by "ACRES USE" divided by "YEARS TO TRADE" = Depreciation cost per acre per year.

INTEREST ---------- ("NEW COST" + "SALVAGE VALUE") divided by "ACRES USE" 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 ("YEARS TO TRADE" X "ANNUAL USE IN HOURS")

60% OF NEW COSTS ------- Used to reflect a mix of new and used equipment.

Table 4: Net Returns to Wine Grape Production

Market Price for Wine Grapes*

Cabernet Sauvignon: $918 weighted average per ton
Chardonnay: $1,122 weighted average per ton

Costs and Returns	Number of Tons Harvested per Acre							
	4		5		6		7	
Total Cash Costs/Acre	$1,629		$1,750		$1,871		$1,993	
Total Cash Costs/Ton		$407		$350		$312		$285
Investment Costs/Acre	$1,653		$1,653		$1,653		$1,653	
Investment Costs/Ton		$413		$331		$276		$236
Total Costs/Acre	$3,282		$3,403		$3,524		$3,646	
Total Costs/Ton		$820		$681		$588		$521
Net Returns per Acre:								
Cabernet Sauvignon								
Total Revenues/Acre	$3,673		$4,591		$5,509		$6,427	
Total Costs /Acre	$3,282		$3,403		$3,524		$3,646	
Total Net Returns/Acre	$391		$1,188		$1,985		$2,781	
Chardonnay								
Total Revenues/Acre	$4,486		$5,608		$6,730		$7,851	
Total Costs /Acre	$3,282		$3,403		$3,524		$3,646	
Total Net Returns/Acre	$1,204		$2,205		$3,206		$4,205	

*From 1991 Grape Crush Report

TABLE 5: SAMPLE WINERY ESTABLISHMENT COSTS

Equipment	Description	Price/Unit 3,200	Price/Unit 10,000	# Units Needed 3,200	# Units Needed 10,000	Total Cost 3,200	Total Cost 10,000
Destemmer/Crusher	2 ton destemmer with pump: Not good quality, rollers on top-not bottom, no variable size, beats grapes	$3,900		1		$3,900	
	Better quality for winery processing 150 tons of grapes		$12,000		1		$12,000
Pump	Electric variable speed, with propellor on wheels	$4,000		1		$4,000	
	Additional pump for larger winery-use one pump for must pump over +		$2,000		1		$2,000
	the electric variable speed pump for barrel work		$4,000		1		$4,000
Hoses & fittings	Complete set for winery producing 3,200 cases of wine	$3,000		1		$3,000	
Fermentation Tanks	$7.00/gallon x 500 gallons = $3,500 per stainless steel tank	$3,500	$3,500	6	19	$21,000	$66,500
Press	2 ton basket press with hydraulic head, block wood on top, one basket	$5,640		1		$5,640	
	2 ton electric hydraulic press with two baskets	$10,500	$10,500	1	1	$10,500	$10,500
	2 ton membrane stainless cage w/frame, programmable computer and axial feed		$36,000		1		$36,000
	1/2 ton bladder basket	$2,000		2		$4,000	
Stainless Steel Tanks	Priced per gallon	$6	$6	7500	24000	$41,250	$132,000
Refrigeration	System for winery processing 3,200 cases of wine	$7,000		1		$7,000	
Barrels	Bourbon (not widely used due to poor quality) with 52 gallon capacity	$115	$115	145	465	$16,675	$53,475
	Standard American Oak barrels w/225l or 60 gallon capacity ($150-230)	$200	$200	125	400	$25,000	$80,000
	Standard French Oak barrles with 225l or 60 gallon capacity	$510	$510	125	400	$63,750	$204,000
	Puncheon from France with 500l or 130 gallon capacity (rarely used)	$800	$800	58	185	$46,400	$148,000
Filtering	Plate and frame to use before bottling (50 tons of grapes do not produce enough lees for lees filtering)	$2,500		1		$2,500	
	Pad filter to use before bottling	$5,000		1		$5,000	
	For lees filtering and before bottling		$12,000		1		$12,000
Bottling	Two ways: 1) purchase bottling equipment; & 2) hire a bottling company which brings its own equipment and personnel						
Bottling Equipment: Washer/purger	Washes bottles and removes oxygen	$865	$865	1	1	$865	$865
Bottler	6 spout	$1,400	$1,400	1	1	$1,400	$1,400
	7 spout with siphon	$2,750	$2,750	1	1	$2,750	$2,750

TABLE 5: SAMPLE WINERY ESTABLISHMENT COSTS

Equipment	Description	Price/Unit		# Units Needed		Total Cost	
		3,200	10,000	3,200	10,000	3,200	10,000
Corker	Semi-automatic	$3,000		1		$3,000	
with vacumn	$3,000 + $2,000 for vacumn	$5,000		1		$5,000	
	Average cost for semi automatic	$6,500	$6,500	1	1	$6,500	$6,500
	Cheapest: $125, Average cost for new corker: $8,000						
Capsuler	Heat	$650		1		$650	
	Spinner	$850		1		$850	
	Average for semi-automatic		$1,060		1		$1,060
Labeler	Manual/hand glue	$530		1		$530	
	Semi-automatic, front and back, self-adhesive		$7,500		1		$7,500
Bottling Service	Per case basis	$2	$2	3300	10000	$6,600	$20,000