

COOPERATIVE EXTENSION SERVICE
UNIVERSITY OF CALIFORNIA
RIVERSIDE, CA 92521

AUGUST 1984

ESTABLISHMENT AND PRODUCTION COSTS
FOR WINE GRAPE VINEYARDS

RANCHO CALIFORNIA, 1983

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Etaferahu Takele
Area Specialist-Farm Management
Cooperative Extension
University of California
Riverside, California 92521

UC, Cooperative Extension

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7. Property tax calculations for 1983 are based upon land values of:
 - a. \$6,000 per acre open land;
 - b. \$10,000 per acre land with one-year-old vines;
 - c. \$13,000 per acre with two-year-old and older vines; and
 - d. property tax is estimated at \$12 per \$1,000.
8. All machinery and equipment costs are based upon:
 - a. new and valued at current market prices;
 - b. straight line depreciation method;
 - c. 13% interest charge on average investment;
 - d. 1.6% charge on average investment for insurance and housing;
 - e. listing of the machinery complement for a 50-acre farm includes:
 - 1) 40 HP tractor;
 - 2) 50 HP tractor;
 - 3) 3/4 ton pickup;
 - 4) mower;
 - 5) sprayer--200 gallon;
 - 5) fertilizer spreader;
 - 7) 4-wheel motorcycle;
 - 8) grape hoe;
 - 9) other tools;
 - 10) irrigation.

with a total investment of about \$100,000.

Based on these assumptions the various cultural practices and cost items are presented in detail in Tables 3 through 7. The summary of costs, broken down into variable, fixed, and total costs, is presented below in Table 2. For any particular year, the variable costs include all cultural input costs, expenses for machinery repair, fuel and lube, interest on operating capital, and labor costs. The fixed costs are: machinery depreciation, interest, insurance, and housing on machinery investment, property taxes on land, and land use charges for production termed as land rental.

TABLE 2
Wine Grape Establishment Costs Per Acre
Rancho, California, 1983
(based on a 50-acre vineyard)

Year	Variable (\$)	Fixed (\$)	Total (\$)	Percent (%)
1	2,154.95	1,261.95	3,416.90	22
2	2,643.80	1,694.55	4,338.35	28
3	1,326.00	2,286.65	3,612.65	22
4	1,361.10	2,770.85	4,131.95	27
Total	7,485.85	8,014.00	15,499.85	100

From this summary, we note the following:

1. Overall, the cost estimates indicate that about \$15,500 is required to establish an acre of vineyard.
2. There seems to be a 50-50 split between variable and fixed costs.
3. Capital requirement during the establishment period is approximately proportional.

The annual production cost is estimated to be \$4,810.05, of which the fixed cost constitutes close to 70%.

Closer investigation as to which cost items have major impact on either the establishment or production costs indicates that items which could be noncash costs in most cases but cash costs in others, play a significant role. These include:

1. Land use charge--If the land is owned, no cash payment is involved. However, there is a cost for using the land for this purpose. So land use charge and property tax together amount to close to \$900 per acre per year. Over the four-year establishment period, these costs items alone contributed to more than \$3,500 per acre.
2. Interest on investment--This could be a cash or a noncash cost depending on whether or not the money for investment is borrowed or owned. If it is borrowed, it is a cash cost. If it is owned, it is a noncash cost. These cost items over the four-year establishment period run close to \$3,000 per acre. Therefore, land charge and interest on investment alone contributes close to 40 percent of the developmental cost.
3. Amortized establishment cost--This is the most significant item of the cost of production, amounting to almost \$2,000 per acre per year over the life of the vineyard.

Farm managers use different approaches in estimating costs. Some account for every cost, cash or noncash. Others, however, do not account for noncash costs. Different methods of estimating costs also result in differences in returns.

To illustrate this, three stages of analysis were performed. First, the variable costs alone were subtracted from the gross returns at various combinations of yields and prices, and the remaining returns were evaluated. In this case, positive returns are realized at prices as low as \$450 per ton and a yield as low as 3 tons per acre (Table 8).

At the second stage, the fixed costs were subtracted as well, but the amortized investment value was excluded. This was done to show the impact of the amortized investment value on cost and thus on returns. The returns, after deducting the variable and fixed costs except for the amortized investment value, are shown in Table 9. In this stage, positive returns are realized at slightly higher prices and yields than before. Positive returns will be realized at prices around \$500 as long as yield stays above 5 tons per acre or at higher yields and higher prices.

At the third stage when the amortized investment cost is included. Positive returns can only be realized at higher prices and higher yields (Table 10).

While developing enterprise costs, the most basic concept in economics--opportunity cost--must be kept in mind. According to the opportunity cost concept, all implicit and explicit costs of productive resources should be included in the enterprise budget because the profitability of the resources used in production should be determined by comparing their use with the next most profitable alternative. For instance,

if one uses his/her own money in wine grape production instead of letting it earn some interest somewhere, he/she has foregone that interest that could have been earned. So the cost of being involved in wine grape production is the amount you have foregone by not using your resources in other alternative uses.

In summary, costs differ from one farm to another depending on location, management practices, and overtime with changes in prices of inputs and outputs. Costs also differ depending on one's method of cost estimation. Therefore, cost study interpretation should accompany use of the underlying assumptions. If they don't fit your situation, then adjustments must be made and estimates based on your specific situation. Cost studies serve to provide a general idea as to what is happening in the area and are guidelines for estimating your own costs.

TABLE 3. First-Year Wine Grape Vineyard Establishment Cost Per Acre
 Rancho California, 1983
 (based on a 50-acre vineyard)

I. VARIABLE COSTS	Input Amount	Price or Cost/Unit	Cost Per Acre	Your Cost Per Acre
A. Cultural Costs				
Grading & ripping			\$ 585.00	
Survey & mark	5 hours	\$6.00/hour	30.00	
Survey stakes	450 pieces	\$0.08/piece	36.00	
Grape plant	450 plants	\$0.58/plant	260.00	
Labor--planting	15 hours	\$6.00/hour	90.00	
Fertilization			20.00	
Weed control*			56.00	
Pest & disease control			110.00	
Hand hoeing*	20 ours	\$6.00/hour	120.00	
Wooden end posts	23 posts	\$4.15/post	95.45	
Labor--spread posts	1 hour	\$6.00/hour	6.00	
Labor--set posts	23 posts	\$1.75/post	40.25	
Irrigation --water	1/2 ac ft	\$200.00/ac ft	100.00	
Irrigation--labor			100.00	
Miscellaneous				
Erosion control**			125.00	
Other (office supplies telephone, gen. bus.)			100.00	
B. Machinery Costs				
Machinery repair, fuel & lube			82.00	
Labor--machinery	16 hours	\$6.00/hour	96.00	
C. Interest on Operating Capital				
	688 dollars	\$0.15/dollar	103.25	
TOTAL VARIABLE COSTS			\$ 2,154.95	
II. FIXED OR OWNERSHIP COSTS				
Machinery & irrigation equipment--depreciation			\$ 228.85	
Machinery & irrigation equipment--Interest			163.65	
Machinery & irrigation equipment--insurance & housing			17.45	
Taxes (land value @ \$6,000 & tax = \$12/1000)			72.00	
Land (net rent, based on land value @ \$6,000 & i = 13%)			780.00	
TOTAL OWNERSHIP COSTS			\$ 1,261.95	
III. TOTAL OF ALL COSTS EXCLUDING MANAGEMENT			\$ 3,416.90	

* In some cases, chemical control was used more than hand hoeing. Therefore, in those cases, weed control costs were higher and hand hoeing costs were lower.

** Erosion control costs were also highly variable, ranging from \$25 - \$190 per acre depending on location, slope, etc.

TABLE 4. Second-Year Wine Grape Vineyard Establishment Cost Per Acre
 Rancho California, 1983
 (based on a 50-acre vineyard)

I. VARIABLE COSTS	Input Amount	Price or Cost/Unit	Cost Per Acre	Your Cost Per Acre
A. Cultural Costs				
Labor--spread post	4 hours	\$6.00/hour	\$ 24.00	
Wooden line post	210 posts	\$1.80/post	378.00	
Labor--set posts	35 hours	\$6.00/hour	210.00	
Labor--string wire	15 hours	\$6.00/hour	90.00	
#13 wire (qa hi tensile)	234 lbs.	\$0.3125/lb.	73.15	
Staples	6 lbs.	\$0.775/lb.	4.65	
Labor--pruning	3 hours	\$6.00/hour	18.00	
Labor--string vine	7 1/2 hours	\$6.00/hour	45.00	
Twine	450 plants	\$0.02/plant	9.00	
Planting	5 hours	\$6.00/hour	30.00	
Grape plant	70 plants	\$0.58/plant	40.00	
Fertilization			20.00	
Weed Control*			56.00	
Training	45 hours	\$6.00/hour	270.00	
Pest & disease control (labor and maint.)	2 hours	\$6.00/hour	12.00	
Hand hoeing*	40 hours	\$6.00/hour	240.00	
Irrigation--water	3/4 ac ft	\$180.00/ac ft	135.00	
Irrigation--labor	14 hours	\$6.00/hour	84.00	
Miscellaneous costs			300.00	
B. Machinery Costs				
Machinery repair, fuel & lube			190.00	
Labor--machinery	38 hours	\$6.00/hour	228.00	
C. Interest on Operating Capital				
	1248 dollars	\$0.15/dollar	187.00	
TOTAL VARIABLE COSTS			\$ 2,643.80	
II. FIXED OR OWNERSHIP COSTS				
Machinery & irrigation equipment--depreciation			\$ 189.40	
Machinery & irrigation equipment--interest			145.45	
Machinery & irrigation equipment--insurance & housing			15.50	
Taxes (land value @ \$10,000 & tax = \$12/1000)			120.00	
Land (net rent, based on land value @ \$6,000 & i = 13%)			780.00	
Interest on investment (\$3,416.90 @ 13%)			444.20	
TOTAL OWNERSHIP COSTS			\$ 1,694.55	
III. TOTAL OF ALL COSTS EXCLUDING MANAGEMENT			\$ 4,338.35	

* In some cases, chemical control was used more than hand hoeing. Therefore, in those cases, weed control costs were higher and hand hoeing costs were lower.

TABLE 5. Third-Year Wine Grape Vineyard Establishment Cost Per Acre
 Rancho California, 1983
 (based on a 50-acre vineyard)

I. VARIABLE COSTS	Input Amount	Price or Cost/Unit	Cost Per Acre	Your Cost Per Acre
A. Cultural Costs				
Labor--prune/tie	20 hours	\$6.00/hour	\$ 120.00	
Plastic ribbon			2.00	
Pruning shears			2.00	
Grape plant	21 plants	\$0.58/plant	12.00	
Labor--planting	2 hours	\$6.00/hour	12.00	
Fertilization			21.00	
Weed control* (herb & mowing)			110.00	
Hand hoeing*	15 hours	\$6.00/hour	90.00	
Pest & disease control			68.00	
Training	35 hours	\$6.00/hour	210.00	
Irrigation--water	1 ac ft	\$200.00/ac ft	200.00	
Irrigation--labor	8 hours	\$6.00/hour	48.00	
Miscellaneous costs				
Other (office supplies telephone, gen. bus.)			110.00	
B. Machinery Costs				
Machinery repair, fuel & lube			75.00	
Labor--machinery	15 hours	\$6.00/hour	90.00	
C. Interest on Operating Capital				
	500 dollars	\$0.13/dollar	65.00	
TOTAL PREHARVEST VARIABLE COSTS			\$ 1,235.00	
D. Harvest Costs				
Picking	1.0 ton	\$70.00/ton	\$ 70.00	
Hauling	1.0 ton	\$10.00/ton	10.00	
Machinery repair, fuel & lube			5.00	
Labor--machinery			6.00	
TOTAL HARVEST COSTS			\$ 91.00	
II. FIXED OR OWNERSHIP COSTS				
Machinery & irrigation equipment--depreciation			\$ 181.50	
Machinery & irrigation equipment--interest			145.45	
Machinery & irrigation equipment--insurance & housing			15.50	
Taxes (land value @ \$13,000 & tax = \$12/1000)			156.00	
Land (net rent, based on land value @ \$6,000 & i = 13%)			780.00	
Interest on investment (\$7,755.25 @ 13%)			1,008.20	
TOTAL OWNERSHIP COSTS			\$ 2,286.65	
III. TOTAL OF ALL COSTS EXCLUDING MANAGEMENT			\$ 3,612.65	

* In some cases, chemical control was used more than hand hoeing. Therefore, in those cases, weed control costs were higher and hand hoeing costs were lower.

TABLE 6. Fourth-Year Wine Grape Vineyard Establishment Cost Per Acre
 Rancho California, 1983
 (based on a 50-acre vineyard)

I. VARIABLE COSTS	Input Amount	Price or Cost/Unit	Cost Per Acre	Your Cost Per Acre
A. Cultural Costs				
Labor--prune/tie	30 hours	\$6.00/hour	\$ 180.00	
Plastic ribbon			2.00	
Pruning tools			2.00	
Fertilization			21.00	
Weed control* (herb & mowing)			88.00	
Hand hoeing*	10 hours	\$6.00/hour	60.00	
Pest & disease control			84.00	
Training & thinning	30 hours	\$6.00/hour	180.00	
Irrigation--water	1 ac ft	\$200.00/ac ft	200.00	
Irrigation--labor	8 hours	\$6.00/hour	48.00	
Miscellaneous costs			110.00	
B. Machinery Costs				
Machinery repair, fuel & lube			63.00	
Labor--machinery	13 hours	\$6.00/hour	78.00	
C. Interest on Operating Capital				
	511 dollars	\$0.15/dollar	76.70	
TOTAL PREHARVEST VARIABLE COSTS			\$ 1,192.70	
D. Harvest Costs				
Picking	2.0 tons	\$70.00/ton	\$ 140.00	
Hauling	2.0 tons	\$10.00/ton	20.00	
Machinery repair, fuel & lube			2.40	
Labor--machinery	1 hour	\$6.00/hour	6.00	
TOTAL HARVEST COSTS			\$ 168.40	
II. FIXED OR OWNERSHIP COSTS				
Machinery & irrigation equipment--depreciation			\$ 189.40	
Machinery & irrigation equipment--interest			151.50	
Machinery & irrigation equipment--insurance & housing			16.15	
Taxes (land value @ \$13,000 & tax = \$12/1000)			156.00	
Land (net rent)			780.00	
Interest on investment (\$11,367.90 @ 13%)			1,477.80	
TOTAL OWNERSHIP COSTS			\$ 2,770.85	
III. TOTAL OF ALL COSTS EXCLUDING MANAGEMENT			\$ 4,131.95	

* In some cases, chemical control was used more than hand hoeing. Therefore, in those cases, weed control costs were higher and hand hoeing costs were lower.

TABLE 7. Annual Cost of Wine Grape Production Per Acre
 Rancho California, 1983
 (based on a 50-acre vineyard)

I. VARIABLE COSTS	Input Amount	Price or Cost/Unit	Cost Per Acre	Your Cost Per Acre
A. Cultural Costs				
Labor--prune/tie	35 hours	\$6.00/hour	\$ 210.00	
Plastic ribbon			2.00	
Pruning tools			5.00	
Fertilization			14.00	
Weed control* (herb & mowing)			110.00	
Hand hoeing*	3 hours	\$6.00/hour	18.00	
Pest & disease control			84.00	
Irrigation--water	1 ac ft	\$180.00/ac ft	180.00	
Irrigation--labor	8 hours	\$6.00/hour	48.00	
Trellis repair	2 hours	\$6.00/hour	12.00	
Miscellaneous costs			240.00	
B. Machinery Costs				
Machinery repair, fuel & lube			60.00	
Labor--machinery	3 hours	\$6.00/hour	18.00	
C. Interest on Operating Capital				
	412 dollars	\$0.15/dollar	61.80	
TOTAL PREHARVEST VARIABLE COSTS			\$ 1,062.80	
D. Harvest Costs				
Picking	6.0 tons	\$70.00/ton	\$ 420.00	
Hauling	6.0 tons	\$10.00/ton	60.00	
Machinery repair, fuel & lube			3.00	
Labor--machinery	1 hour	\$6.00/hour	6.00	
TOTAL HARVEST COSTS			\$ 489.00	
II. FIXED OR OWNERSHIP COSTS				
Machinery & irrigation equipment--depreciation			\$ 197.25	
Machinery & irrigation equipment--interest			151.50	
Machinery & irrigation equipment--insurance & housing			15.50	
Taxes (land value @ \$13,000 & tax = \$12/1000)			156.00	
Land (net rent)			780.00	
Amortized established cost (over 25 years)			1,958.00	
TOTAL OWNERSHIP COSTS			\$ 3,258.25	
III. TOTAL OF ALL COSTS EXCLUDING MANAGEMENT			\$ 4,810.05	

* In some cases, chemical control was used more than hand hoeing. Therefore, in those cases, weed control costs were higher and hand hoeing costs were lower.

TABLE 8. Returns to FC, Management and Risk,
Wine Grape Production
Rancho California, 1983

Yield Tons/Acre	Price Per Ton							
	\$450	\$500	\$550	\$600	\$650	\$700	\$750	\$800
2	- 323	- 223	- 123	- 23	77	177	277	377
3	47	197	347	497	647	797	947	1097
4	417	617	817	1017	1217	1417	1617	1817
5	797	1037	1287	1537	1787	2037	2287	2537
6	1157	1457	1757	2057	2357	2657	2957	3257
7	1527	1877	2227	2577	2927	3277	3627	3977
8	1897	2297	2697	3097	3497	3897	4297	4697
9	2267	2717	3167	3617	4067	4517	4967	5417
10	2637	3137	3637	4137	4637	5137	5637	6137

* Returns after deduction of variable costs.

TABLE 9. Returns to Investment Cost, Management and Risk,
Wine Grape Production
Rancho California, 1983

Yield Tons/Acre	Price Per Ton							
	\$450	\$500	\$550	\$600	\$650	\$700	\$750	\$800
2	-1623	-1523	-1423	-1323	-1223	-1123	-1023	- 923
3	-1253	-1103	- 953	- 803	- 653	- 503	- 353	- 203
4	- 883	- 683	- 483	- 283	- 83	117	317	517
5	- 513	- 263	- 13	237	487	737	987	1237
6	- 143	157	457	757	1057	1357	1657	1957
7	227	577	927	1277	1627	1977	2327	2677
8	597	997	1397	1797	2197	2597	2997	3397
9	967	1417	1867	2317	2767	3217	3667	4117
10	1337	1837	2337	2837	3337	3837	4337	4837

* Returns after deduction of variable cost and fixed cost excluding the amortized investment cost.

TABLE 10. Returns to Management and Risk
Wine Grape Production
Rancho California, 1983

Yield Tons/Acre	Price Per Ton							
	\$450	\$500	\$550	\$600	\$650	\$700	\$750	\$800
2	-3581	-3481	-3381	-3281	-3181	-3081	-2981	-2881
3	-3211	-3061	-2911	-2761	-2611	-2461	-2311	-2161
4	-2841	-2641	-2441	-2241	-2041	-1841	-1641	-1441
5	-2471	-2221	-1971	-1721	-1471	-1221	- 971	- 721
6	-2101	-1801	-1501	-1201	- 901	- 601	- 301	- 1
7	-1731	-1381	-1031	- 681	- 331	19	369	719
8	-1361	- 961	- 561	- 161	239	639	1039	1439
9	- 991	- 541	- 91	359	- 809	1259	1709	2159
10	- 621	- 121	379	879	1379	1879	2379	2879

* Returns after deduction of variable cost and fixed cost including the amortized investment cost.