University of California Cooperative Extension Publication

Wine Grapes

Sample Establishment and Production Costs and Profitability Analysis
Temecula, Riverside, CA 2002

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SECTION I

Background

The wine grape industry in Riverside County constitutes a small but stable acreage of about 2,100 acres in the 1990s. Figure 1 presents the historical wine grape acreage trends in Riverside County from 1975 to 2000. The main wine grape production area is around the Temecula area where it constitutes about 80% of the county's bearing acreage.

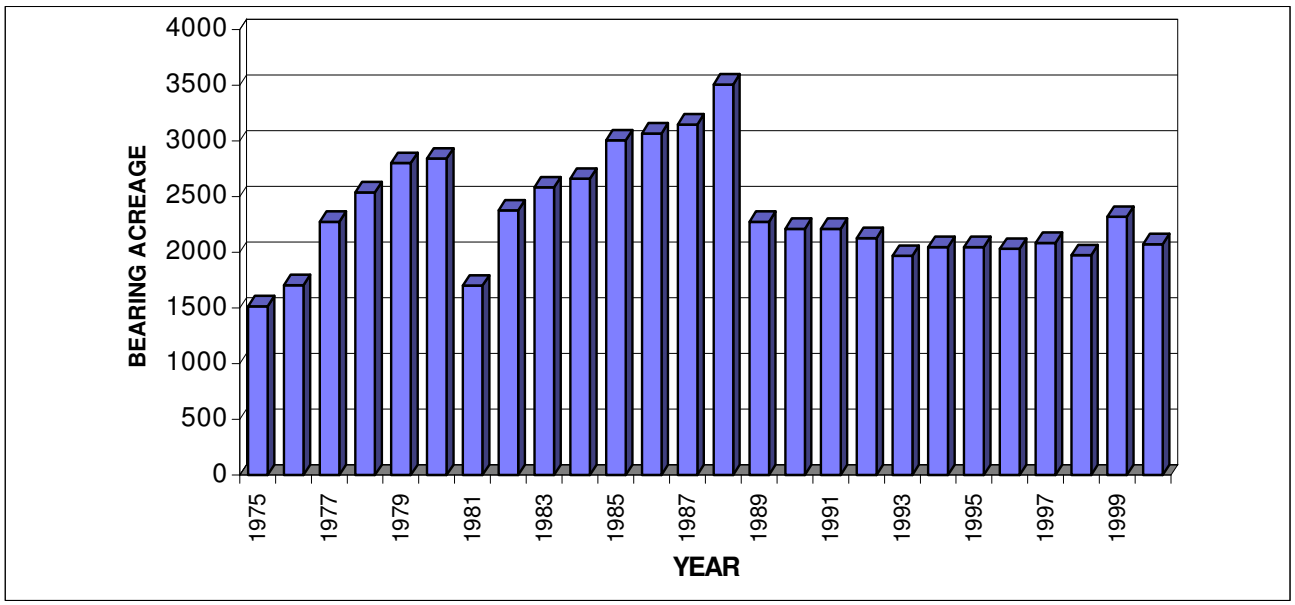

Figure 1. Wine Grape Bearing Acreage in Riverside County, 1975-2000
Source: 1975-2000 Agricultural Crop Report, County of Riverside, Protection and Service, Agricultural Commissioner, Weights and Measures.

In recent years the grape industry in Temecula Valley has experienced an epidemic of Pierce's disease, a malady caused by *Xyllella fastidiosa*, a bacterium transmitted by the Glassy Winged Sharp Shooter (*Homalodisca coagulata*). Several vineyards were removed from production due to infection and are now being replanted. New methods and practices such as narrow space plantings and new trellising systems are being incorporated to improve the quality of wine grapes and to increase efficacy of fungicide and pesticide applications. This study provides economic analyses as a basis for growers to evaluate the profitability and future prospects of their investment using these new methods/systems of establishment and production practices of wine grapes in Temecula, Riverside County. The study includes:

- Estimates and analyses of establishment and production costs
- Analyses of profitability

Data on production practices and costs for this study was collected from growers, management companies, and dealers primarily through personal and telephone interviews conducted in February of 2002.

SECTION II

ASSUMPTIONS OF ESTABLISHMENT AND PRODUCTION PRACTICES

To simplify information, trade names of some products have been used in this report. No endorsement of named products is intended, nor criticism implied of similar products that are not mentioned.

The study is based on current practices of wine grape production in Temecula, Riverside County. While the practices outlined in this study may not fit all situations, they represent current trends of production. The cost development and analysis methodology can also be easily adapted to address individual situations to evaluate investment needs and profits, not only in Temecula, Riverside County but also in other production areas throughout California. When practices deviate from those given in this publication, growers can enter and substitute their own costs for comparison with this study.

Following is a discussion of the assumptions and calculation methods we used in this study. Cultural practices and cost data are presented in detail in several tables in the Appendix. *Please note that because of rounding, the totals given in the tables may differ slightly from the sums of the components.*

1. ORCHARD SPECIFICATIONS

We used a vineyard size of 20 acres as a basis for evaluating investment and production costs. Appendix Table A provides the machinery complement we developed for an owner-operated vineyard. Please also note that vineyards of this size are mostly operated by management companies in which case machinery costs are included as part of operation charges.

Major grape varieties in Temecula Valley for white wine include Chardonnay and Sauvignon Blanc and for red wine Cabernet Sauvignon, Merlot, and Zinfandel.

Cultural practices were considered common to all varieties; however, we encourage growers to make adjustments for variety differences where they exist. For instance, yield differences will lead to differences in harvesting costs. Also varieties may differ in pruning requirements and costs.

2. ESTABLISHMENT AND PRODUCTION PRACTICES

Land Preparation for Orchard Establishment. Land preparation begins with grading and ripping. Most growers or management companies hire contractors to have these operations done. Costs are estimated at $1,300 per acre.

Survey and Mark. The ground is surveyed using about 15 wooden stakes per acre. Then plastic knives are used to mark the points where the vines will be planted.

Trellis System. The trellis system is designed to support a vertical bilateral cordon system. Steel end posts are installed at the end of each row. Then steel line posts are put along side one-thirds of the vine plants and training stakes are used along side the remainder two-thirds

of the vine plants. These posts are used to spread and support the six to seven wires (a cordon wire at the bottom, followed by a drip wire and four to five catch wires) needed to train the vine cordons. The cordon and drip wires approximately 12 and 14 gauge thick, respectively are installed during the first year. The catch wires, which are approximately 13 gauges thick, are installed in the second year.

Planting. Selections of vine varieties are based on resistance to nematodes and *Phylloxera* as well as suitability to soil conditions. Vines are planted in early spring of the first year. We used a price of $4.00/plant in this study, which is the most common price obtained from our producers interview. Vine costs range from $3.50/plant to 5.00/plant.

Planting spaces vary depending on location and topography of field. In Temecula, planting spaces of 9' x 6' and 10" x 6 are common. We based this study on 9' x 6' spacing (806 plants/acre).

Weed Management. Weed management includes both spraying and mowing several times usually from March through June every year.

Fertilization. Nitrogen and potassium fertilizers are applied through three or more times a year depending on need of the vineyard through the drip irrigation. Beginning year three, foliar or micro nutrient fertilizers are sprayed three to six times, in spring and fall. Fertilizer costs in this study include the average of several growers.

Pest and Disease Management. Pest and disease management include controls for gophers, squirrel, GWSS and Pierce's disease. Disease control also involves treatments for powdery mildew. In any year, multiple applications may be needed for both pest and disease control. Weather conditions determine the type of material, the frequency and number of times of applications.

Other pests and diseases may be present in the orchard. Information and pesticide use permits are available from the county Agricultural Commissioner's office. Pest management information is also available from the University of California Statewide Integrated Pest Management Project website, http://www.ipm.ucdavis.edu/PMG/selectnewpest.grapes.html.

Training, Tying and Suckering. Training, tying and suckering operations are done in the first year after the shoots extend beyond the top of the grow tubes and also in the second year of establishment. The operations involve directing, tying and suckering selected shoots along the cordon wire in three passes. The tying operation continues through out the life of the orchard. It involves checking and retying as well as replacing the green or tying tapes where necessary.

Pruning and Shoot Thinning. These operations are done annually beginning year 3 of the vine establishment. During establishment pruning involves only trimming and shaving the cordon extensions to the appropriate girth and selecting spur positions on the original cordons.

Irrigation. A drip irrigation system, which includes, drippers/emitters (two per plant), irrigation lines, valves, flow meters, controller, and miscellaneous fittings is installed before planting in year 1.

The frequency and amount of water use depends on weather and rainfall. In some years irrigation is needed every month of the year, and in other years irrigation may not be required for more than four to five months. In this study we assumed irrigation taking place two times per week from April through June and three times a week from July through September. The amount of water use in acre-feet includes 0.50 in the first year, 1 in the second year, 1.50 in the third year and 2 thereafter. Also deficit irrigation is being practiced to improve grape quality in which case the amount and the cost of water would be lower.

Water costs vary, depending on location. We used a charge for the most typical situation of a medium-sloped vineyard of $360/acre-foot. Water is purchased from the local irrigation district.

Labor cost to inspect the irrigation system for water flows and to fix any problems such as leaks or emitter clogging caused by squirrels, insects, chemical precipitation etc. is estimated to take 30 minutes per10 acres per irrigation.

3. HARVEST COSTS

Harvest begins in year three and is mostly done in late summer. Harvesting costs for this study include picking and hauling to local buyers. The costs are $110/ton for picking and $15/ton for hauling.

4. INTEREST ON OPERATING CAPITAL

We calculated interest on operating capital at a nominal rate of 9% per year. This rate is a three-year average (1999 to 2001) collected from some local banks. Interest on operating capital reflects the costs of borrowing or an opportunity cost for using non- borrowed money.

5. LABOR

Both owner and hired labor are estimated at hourly rates (including benefits) of $9.50 for manual work and $12 for operating machines.

7. EQUIPMENT OPERATING CASH COSTS

Equipment operating cash costs including fuel, lubrication, and repairs are calculated using formulas and coefficients developed by the American Society of Agricultural Engineers (ASAE). 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 machinery horsepower (maximum PTO hp) and type of fuel used.

8. CASH OVERHEAD

Property taxes. Property taxes in this study are calculated at 1%, the same as the base rate that most counties assess on land, equipment, buildings, and improvements. Special assessment districts in some counties may have additional taxes on property.

Property insurance. Growers also carry insurance for property protection, which is typically calculated at 0.66 percent of the average value of assets. In addition, a 20 acres vineyard would carry a liability insurance of $409 per year to cover accidents on the entire farm.

Sanitation Costs: Sanitation facilities are rented year round. Usually one system could serve several acres.

Office expenses. Expenses in this category include office supplies, telephone services, operating costs for office equipment such as fax machines, photocopiers and computers as well as bookkeeping, accounting, legal fees, and so on. The overall office expense is estimated at $120 per acre

Investment repairs. Investment repairs and maintenances are calculated at 1 to 3.5 percent of the investment values as suggested in some farm management books.

Interest on establishment. Interest on establishment is calculated to reflect the accruing of charges on loans or returns forgone for resources used during the establishment years.

9. NON-CASH OVERHEAD COSTS

This category includes land rent and ownership (fixed) costs of farm equipment and investments such as buildings, tools, fuel tanks and pumps, irrigation systems, and amortized tree establishment costs.

Land rent. Recent cases of vineyard developments in Temecula are on previous vineyard ground. Therefore outstanding loans on the land may not exist. However, we place an opportunity cost for the use of land in wine grape production to show that the land or its value could have been used in other return (interest) yielding alternatives. The land rent is to reflect the return foregone from those alternatives.

Land rent is estimated at 6.5% (California's long-term rate of return on agricultural production assets from current income) of the value of open land. The idea is that the use of land should at least earn this rate. Growers indicated that open land values for vineyard vary tremendously but on average approximate $15,000/acre. Growers should pay particular attention to the value of land when evaluating profitability.

The total land used in this study is 20 acres; 19 planted and one acre used to build roads and farmstead.

Ownership costs of farm equipment and investments. These costs are calculated using the capital recovery method. This method allows growers to calculate an annual amount of money to charge the enterprise so that the value of assets will be recovered within a specified period of time at a designated interest rate. The formula to calculate capital recovery is as follows:

[(Purchase Price-Salvage Value) x (Capital Recovery Factor)]+[(Salvage Value) x (Interest Rate)]

The various parts of the capital recovery calculation include a10% salvage value and a capital recovery factor calculated at 6.5% interest rate-- (California's long-term rate of return of agricultural production assets from current income) and the number of years service of equipments and investments. Because farms use a mix of old and new equipment, we estimated the values at 60% of the current year's (2002) prices.

Amortized tree establishment cost. This is the annual capital recovery of the accumulated tree establishment costs. It is calculated by amortizing the net establishment costs (income-costs) at the 6.5% (California's long-term rate of return of agricultural production assets from current income) interest rate over a 27 years productive life.

YIELD AND PRICES

Yield. Yield estimates include 2.5 tons per acre in the third year of establishment and an average of 6 tons per acre (~15 lbs/vine) in production years. However, for those growers whose yield may differ from our assumption, we analyzed returns and profitability using other scenarios (Table 3).

Prices. We used the county five-year (1997-2001) weighted average price of $1,025/ton for Chardonnay, Cabernet Sauvignon, and Merlot varieties as a basis to estimate returns. Also, we analyzed the impact on returns and profits of a range of prices.

SUMMARY OF ESTABLISHMENT AND PRODUCTION COSTS

Based on our assumptions of cultural practices and methods of analyses, vineyard establishment in Temecula, Riverside is estimated to cost $21,356/acre: $12,248/acre in the first year, $5,195/acre in the second year, and $3,912/acre in the third year (Tables 1 and 2). The detail cultural practices and costs for each of the establishment and the production year are presented in Appendix Tables A to L.

The annual production cost is estimated at $7,645/acre (Tables 1 and 2). The pie graph below shows the breakdown of costs which includes 37% for operating cultural cash costs. Also monthly cash production costs are shown on Table 4. Harvesting costs using the 6 tons yield assumption constitutes 10 % of the total production costs, while interest on operating capital accounts for 2%, cash overhead 10%, and non-cash overhead 41%.

Table 1. Costs per Acre for Establishment and Production of Wine Grapes
by Production Practices
Temecula, Riverside County, 2002

	Year 1	Year 2	Year 3	Production Year
I. OPERATING (CASH) COSTS (Materials, Labor, Fuel, Lube, & Repair)				
A. Cultural Costs (preharvest)				
Grade & Rip	1,300			
Survey & Mark	266			
Trellis System Installation	2,618	410		
Plant Vine	4,410	389		
Pest & Disease Control	255	255	303	303
Train & Tie & Sucker	398	398	143	143
Shoot Thin			510	510
Prune			319	447
Fertilize	30	30	228	228
Weed Control	19	19	19	14
Cover Crop	105	105	105	105
Irrigate	212	392	572	752
B. Machinery Costs (Fuel, Lube, & Repair)	**176**	**133**	**294**	**294**
C. Harvest Costs			**283**	**783**
TOTAL OPERATING COSTS	**9,789**	**2,130**	**2,776**	**3,579**
II. CASH OVERHEAD COSTS				
Office Expenses	120	120	120	120
Taxes & Insurance	198	284	330	528
Liability Insurance	20	20	20	20
Investment Repair	62	62	62	62
Interest on Establishment	0	1,102	1,570	0
TOTAL CASH OVERHEAD COSTS	**400**	**1,589**	**2,102**	**730**
Interest on Operating Capital and Cash Overhead	**682**	**128**	**128**	**167**
TOTAL CASH COSTS	**10,871**	**3,847**	**5,007**	**4,476**
LESS INCOME FROM PRODUCTION	**0**	**0**	**-2,563**	**-6,150**
NET CASH COSTS FOR THE YEAR	**10,871**	**3,847**	**2,444**	**-1,674**
ACCUMULATED NET CASH COSTS	**10,871**	**14,717**	**17,162**	
III. NON-CASH OVERHEAD COSTS (Depreciation & Interest)				
Land Rent	1,027	1,027	1,027	1,027
Building	23	23	23	23
Tools	6	6	6	6
Fuel Tanks & Pumps	7	7	7	7
Sanitation Costs	6	6	6	6
Drip Irrigation	169	169	169	169
Depr. & Interest	140	112	232	232
Amortized Tree Establishment Cost	0	0	0	1,700
TOTAL NON-CASH OVERHEAD COSTS	**1,377**	**1,349**	**1,468**	**3,168**
TOTAL COSTS FOR THE YEAR	**12,248**	**5,195**	**6,475**	**7,645**
TOTAL NET COSTS FOR THE YEAR	**12,248**	**5,195**	**3,912**	**1,495**
ACCUMULATED NET COSTS	**12,248**	**17,443**	**21,356**	

Table 2. Costs per Acre for Establishment and Production of Wine Grapes
(by Custom, Material, & Labor Costs)
Temecula, Riverside County, 2002

	Year 1	Year 2	Year 3	Production Year
I. OPERATING (CASH) COSTS (Materials, Labor, Fuel, Lube, & Repair)				
A. Cultural Costs (preharvest)				
Custom:				
Grade & Rip	1,300			
Material:				
Survey & Mark	114			
Trellis System	2,005	153		
Plant Vine	3,748	322		
Pest & Disease Control	193	193	241	241
Train & Tie & Sucker	15	15	15	15
Shoot Thin				
Prune				
Fertilize	30	30	228	228
Weed Control	19	19	19	14
Cover Crop	105	105	105	105
Irrigate	180	360	540	720
Material Costs Total:	**6,409**	**1,197**	**1,147**	**1,323**
Labor:				
Survey & Mark	152			
Trellis System Installation	613	257		
Plant Vine	662	66		
Pest & Disease Control	63	63	63	63
Train & Tie & Sucker	383	383	128	128
Shoot Thin			510	510
Prune			319	447
Fertilize				
Weed Control				
Cover Crop				
Irrigate	32	32	32	32
Labor Costs Total:	**1,904**	**800**	**1,052**	**1,179**
B. Machinery Costs (Fuel, Lube, & Repair)	**176**	**133**	**294**	**294**
C. Harvest Costs			**283**	**783**
TOTAL OPERATING COSTS	**9,789**	**2,130**	**2,776**	**3,579**
II. CASH OVERHEAD COSTS				
Office Expenses	120	120	120	120
Taxes & Insurance	198	284	330	528
Liability Insurance	20	20	20	20
Investment Repair	62	62	62	62
Interest on Establishment	0	1,102	1,570	0
TOTAL CASH OVERHEAD COSTS	**400**	**1,589**	**2,102**	**730**
Interest on Operating Capital and Cash Overhead	**682**	**128**	**128**	**167**
TOTAL CASH COSTS	**10,871**	**3,847**	**5,007**	**4,476**
LESS INCOME FROM PRODUCTION	**0**	**0**	**-2,563**	**-6,150**
NET CASH COSTS FOR THE YEAR	**10,871**	**3,847**	**2,444**	**-1,674**
ACCUMULATED NET CASH COSTS	**10,871**	**14,717**	**17,162**	**0**

Table 2. Contd.				
	Year 1	Year 2	Year 3	Production Year
III. NON-CASH OVERHEAD COSTS (Depreciation & Interest)				
Land Rent	1,027	1,027	1,027	1,027
Building	23	23	23	23
Tools	6	6	6	6
Fuel Tanks & Pumps	7	7	7	7
Sanitation Costs	6	6	6	6
Drip Irrigation	169	169	169	169
Depr. & Interest	140	112	232	232
Amortized Tree Establishment Cost	0	0	0	1,700
TOTAL NON-CASH OVERHEAD COSTS	**1,377**	**1,349**	**1,468**	**3,168**
TOTAL COSTS FOR THE YEAR	**12,248**	**5,195**	**6,475**	**7,645**
TOTAL NET COSTS FOR THE YEAR	**12,248**	**5,195**	**3,912**	**1,495**
ACCUMULATED NET COSTS	**12,248**	**17,443**	**21,356**	**0**

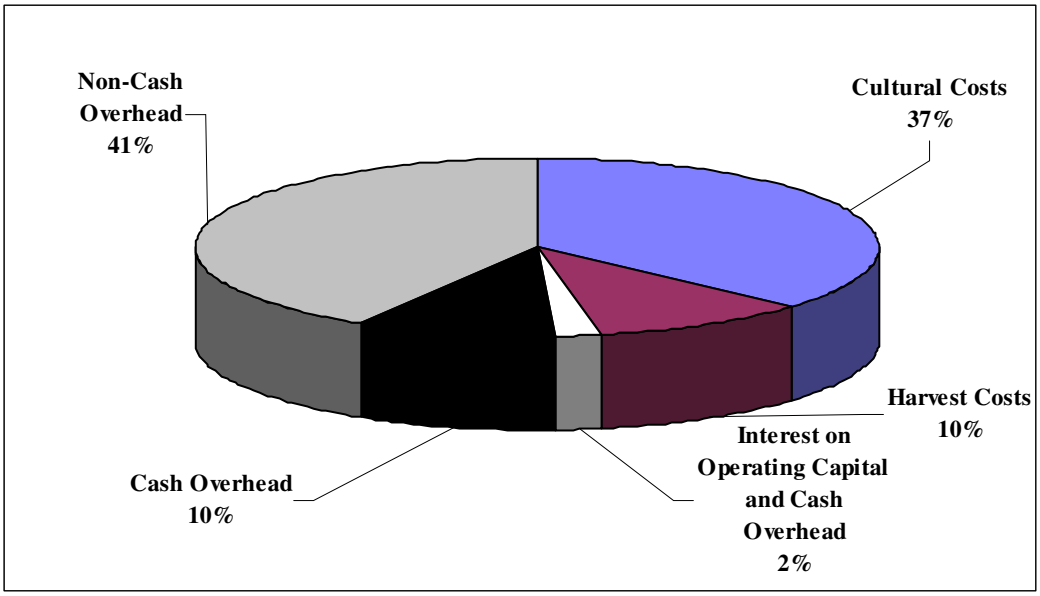

Figure 1. Proportion of Wine Grape Production Costs
Temecula, California, 2002 (based on 20-acre Vineyard)

SECTION III

Profitability Analysis

Profitability is analyzed by calculating costs per unit/breakeven prices as well as gross and economic margins at various yield and prices (Table 3).

Table 3. Profitability Analyses: Range Analyses
Costs Per Ton, Gross Margins and Returns to Management
Temecula, Riverside County, 2002

Yield/Acre	**4**	**5**	**6**	**7**	**8**
Part A. Costs per acre and per ton at varying yields					
Operating costs/acre:					
Cultural Costs	2,796	2,796	2,796	2,796	2,796
Harvesting Costs	533	658	783	908	1,033
TOTAL OPERATING COSTS/ACRE	**3,329**	**3,454**	**3,579**	**3,704**	**3,829**
TOTAL OPERATING COSTS/TON	**832**	**691**	**597**	**529**	**479**
CASH OVERHEAD COSTS/ACRE	**730**	**730**	**730**	**730**	**730**
Interest on Operating Capital and Cash Overhead	**163**	**165**	**167**	**169**	**171**
TOTAL CASH COSTS/ACRE	**4,222**	**4,349**	**4,476**	**4,603**	**4,730**
TOTAL CASH COSTS/TON	**1,056**	**870**	**746**	**658**	**591**
NON-CASH OVERHEAD COSTS/ACRE	**3,168**	**3,168**	**3,168**	**3,168**	**3,168**
TOTAL COSTS/ACRE	**7,391**	**7,517**	**7,645**	**7,771**	**7,898**
TOTAL COSTS/TON	**1,848**	**1,503**	**1,274**	**1,110**	**987**
Part B. Returns per acre above all cash costs (gross margin)					
Price ($/ton):					
800	-1,022	-349	324	997	1,670
900	-622	151	924	1,697	2,470
1,000	-222	651	1,524	2,397	3,270
1,025	-122	776	1,674	2,572	3,470
1,100	178	1,151	2,124	3,097	4,070
1,200	578	1,651	2,724	3,797	4,870
1,300	978	2,151	3,324	4,497	5,670
Part C. Returns per acre above total costs (returns to management)					
Price ($/ton):					
800	-4,191	-3,517	-2,845	-2,171	-1,498
900	-3,791	-3,017	-2,245	-1,471	-698
1,000	-3,391	-2,517	-1,645	-771	102
1,025	-3,291	-2,392	-1,495	-596	302
1,100	-2,991	-2,017	-1,045	-71	902
1,200	-2,591	-1,517	-445	629	1,702
1,300	-2,191	-1,017	155	1,329	2,502

Table 4. Monthly cash costs per acre to produce wine grapes in Temecula, 2002

	Costs per acre ($)												
Beginning Nov 2001 Ending Oct 2002	**Nov 2001**	**Dec 2001**	**Jan 2002**	**Feb 2002**	**Mar 2002**	**Apr 2002**	**May 2002**	**Jun 2002**	**Jul 2002**	**Aug 2002**	**Sep 2002**	**Oct 2002**	**TOTAL**
I. OPERATING (CASH) COSTS (Materials, Labor, Fuel, Lube, & Repair)													
Cultural Costs (preharvest)													
Fertilize-Soil Program	25				25							25	75
Prune				453									453
Gopher Bait-Strychine				43			43						87
Mow Cover Crop					7	7	7	7					27
Fertilize-Foliar Program					107							107	213
Squirrel Bait-Diphacinone					8				8				17
Pest & Disease (Dry Sulfur)						56		19	19				94
Pest & Disease (Micronized Sulfur)						36		12	12				59
Sharp Shooter Control- Admire						152							152
Shoot Thin							510						510
Weed Control (Roundup)							13		13				26
Tie Green Tape												143	143
Weed Control (Karmex)												8	8
Cover Crop												112	112
Water Costs & Manual Labor						100	100	100	150	150	150		752
Pickup	6	6	6	6	6	6	6	6	6	6	6	6	69
Harvest Costs													
Picking										165	330	165	660
Hauling										23	45	23	90
Forklift-Rental										8	17	8	33
TOTAL OPERATING COSTS	**31**	**6**	**6**	**502**	**152**	**358**	**679**	**143**	**207**	**352**	**548**	**596**	**3,579**
II. CASH OVERHEAD COSTS													
Office Expenses	10	10	10	10	10	10	10	10	10	10	10	10	120
Taxes & Insurance			264					264					528
Liability Insurance						20							20
Investment Repair	5	5	5	5	5	5	5	5	5	5	5	5	62
TOTAL CASH OVERHEAD COSTS	**15**	**15**	**279**	**15**	**15**	**36**	**15**	**279**	**15**	**15**	**15**	**15**	**730**
Interest on Operating Capital & Cash Overhead	4	2	21	35	10	21	31	16	7	8	8	5	**168**
TOTAL CASH COSTS/ACRE	**50**	**23**	**306**	**552**	**177**	**414**	**726**	**438**	**229**	**375**	**571**	**615**	**4,477**

Breakeven costs allow growers to compare the unit cost of production with expected market prices. It is calculated as the cost of production per acre divided by yield per acre. Gross margin is returns above cash costs. It approximates the returns to management and investment. It is what growers often refer to as *profit* if there are no capital debts. Deduct depreciation it also approximates taxable income. Gross margin is calculated as gross returns (price times yield) minus cash costs of production.

Economic profit is returns above total costs of production including management. It is a very useful measure of how attractive the enterprise is for potential investors and entrants into the business. Economic profit can be positive or zero. A zero economic profit should not be alarming if all costs, including the owners' labor and management fees, are included in the production cost. In this study we do not include management charges, so the returns after all costs are deducted reflects returns to management. Returns to management are calculated as gross returns minus cash and non-cash costs of production.

Cash costs/ton are lower than the average price of $1,025/ton for yield level above 4 tons/acre (Table 3 Part A). Similarly, at the average price of $1,025/ton, gross margins would be positive for yield level above 4 tons/acre (Table 3 part B), but positive returns to management would be attained at above 7.5 tons/acre (Table 3 Part C). Cash costs/ton at other yield levels as well as gross margins and returns to management at various combinations of yield and prices are presented in the range analyses for growers to find figures that best match their specific situations.

Summary and Conclusion

Temecula Valley is the major wine grape production in Riverside County. Currently the region has experienced a severe Pierce's disease epidemic vectored by the GWSS. Several vineyards were pulled out but are now being replanted applying new cultural and management methods. The new practices include narrower space planting, changes in trellis system maintenance, pruning and shoot thinning.

This study provides cost estimates based on current establishment and production practices for growers to use (i) as a guide to evaluate the profitability and future prospects of their investment and (ii) as a tool for financial and business transactions. Also, growers can modify these costs and analyses to fit their specific situations.

The vineyard of our assumption costs $21,356/acre to establish and $7,645/acre/year to produce wine grapes. Gross margins (returns above variable costs) would be positive for yield above 4 tons/acre at the county average price of $1,025/ton, but would require above 7.5 tons/acre to attain positive returns to management. Positive returns to management can also be attained at higher prices and lower yield or some combination as shown in our range analyses. Growers to maximize their returns must understand the relationship of prices and productivity in wine grape production and must watch both the quality and quantity of their production. We suggest that growers and buyers talk with each other to establish expectations regarding quality standards, crop volume and prices.

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Appendix Table A. Machinery and Investment Costs for Establishment and Production of Wine Grapes
Based on 20-Acre Vineyard and 30-Years Life of Orchard
Temecula, California 2002

Machine Type	Machine Size		Purchase Price[1] 2002	Salvage Value	Years to Trade (A)	Annual Hours of Use (B)	Total Hours of Use (A)*(B)	Cash Costs (Variable) Per Hour: Fuel	Lube	Repair	Total Cash Cost	Cash Overhead Costs Per Hour: Taxes & Insurance @ 1.66%	Non-Cash Overhead (Fixed/Ownership) Costs Per Hour: Depr. & Interest (Capital Recovery Method)[2]	Total Cost/ Hour
Equipment														
60HPTractor	60	HP	22,302	2,230	30	250	7,500	3.33	0.50	1.62	5.44	0.81	6.73	12.99
Pickup	0.50	TON	19,000	1,900	30	60	1,800	3.02	0.45	6.33	9.81	2.89	23.89	36.59
Mower	8	FT	3,600	360	30	40	1,200	0.00	0.00	1.85	1.85	0.82	6.79	9.46
Weed Sprayer	150	GAL	1,620	162	30	25	750	0.00	0.00	1.16	1.16	0.59	4.89	6.64
Orchard Sprayer	300	GAL	14,000	1,400	30	40	1,200	0.00	0.00	11.67	11.67	3.20	26.40	41.27
Duster	300	GAL	4,500	450	15	95	1,425	0.00	0.00	3.79	3.79	0.43	4.84	9.07
Grass Seeder	5	FT	3,900	390	30	25	750	0.00	0.00	2.78	2.78	1.42	11.77	15.98
Trailer			2,250	225	30	20	600	0.00	0.00	1.84	1.84	1.03	8.49	11.36
TOTAL			**71,172**	**7,117**				**6.35**	**0.95**	**31.04**	**38.34**	**11.20**	**93.80**	**143.34**

Machine Type		Purchase Price 2002	Salvage Value	Years to Trade (A)	Cash Costs (Variable) Per Acre	Cash Overhead Costs Per Acre: Taxes & Insurance @ 1.66%	Repair	Total Cash Overhead Costs	Non-Cash Overhead (Fixed/Ownership) Costs Per Acre: Depr. & Interest (Capital Recovery Method)[2]	Total Cost/ Acre
Investment										
Land		316,000	316,000	30		158.00	0.00	158.00	1,027.00	1,185.00
Building		6,000	600	30		2.49	6.75	9.24	22.98	32.22
Other Tools		1,500	150	30		0.62	1.69	2.31	5.75	8.06
Fuel Tanks & Pumps		1,700	170	30		0.71	1.91	2.62	6.51	9.13
Portable Toilets		1,560	156	30		0.65	1.76	2.40	5.97	8.38
Drip Irrigation	Drip	44,000	4,400	30		18.26	49.50	67.76	168.52	236.28
Amortized Establishment Cost		427,116	0	27		177.25	0.00	177.25	1,699.92	1,877.17
TOTAL		**797,876**	**321,476**			**357.98**	**61.61**	**419.58**	**2,936.65**	**3,356.23**

[1]Purchase price for Tractor, Mower, Weed Sprayer, Grass Seeder, and Trailer is estimated at 60% of the new value to reflect the mix of new and old machine and equipment on the farm.

[2]Depreciation & Interest (Capital Recovery) costs calculated at the 6.50% rate of interest (the long-term average (1990-2000) rate of return to California's agricultural production assets from current income).

Calculations for Equipment and Machine Costs are as follow:

*Taxes & Insurance/Hour=[(Purchase Price+Salvage Value)*TI Rate]/[2*Annual Hours Use]*

Repair/Hour=(List Price Total Accumulated Repairs as a Percentage of List Price)/Hours Use over Machine's Useful Life*

Depreciation and Interest: Capital Recovery Costs /Hour=[(Purchase Price-Salvage Value)(Capital Recovery Factor)]+[Salvage Value*LongTerm Interest Rate]/Annual Hours Use;*

Capital Recovery Factor = f(Years of Life (30), Long Term Rate 6.5%)=0.077

Capital Recovery Factor = f(Years of Life (15), Long Term Rate 6.5%)=0.1064

Calculations for Investment Costs are as follow:

*Taxes & Insurance/Acre=[(Purchase Price*TI Rate)/[2*No. of Acres]; For Land we have only Taxes, no Insurance needed.*

Repair/Acre=(List Price 2.25%)/No. of Acres*

Depreciation and Interest: Capital Recovery Costs /Acre=[(Purchase Price)(Capital Recovery Factor)]/No. of Acres; Capital Recovery Factor = f(Years of Life(30), Long Term Rate 6.5%)=0.077*

Capital Recovery Factor for Amortized Establishment Costs= f(Years of Life (27), Long Term Rate 6.5%)=0.0796

*Land Rent=Price of Land*6.5% (the long-term average (1990-2000) rate of return to California's agricultural production assets from current income)*

Appendix Table B. Schedule of First-Year Vineyard Establishment Operations and Costs per Acre
Based on 20-Acre Vineyard and 30-Years Life of Orchard
Temecula, California 2002

Operation	Method of Application	Month	Cash Costs										Cash Overhead Costs				Total Cash Costs	IOC	Dep. & Int.	Total Costs
			MHRS	MAT	Custom	F&L	MR	MLHRS	MLC	HLHRS	HLC	Total	T&I	IR	Other	Total				
				(A)	(B)	(C)	(D)		(E)		(F)	(G)=(A)+(B)+(C)+(D)+(E)+(F)	(H)	(I)	(J)	(K)=(H)+(I)+(J)	(L)=(G)+(K)	(M)	(N)	(O)=(L)+(M)+(N)
Grade & Rip	Custom	Nov			1,300							1,300.00					1,300.00	117.00		1,417
Survey & Mark	60HPTractor	Nov	0.46	39.18	75	1.76	0.74	0.51	6.07	16.00	152.00	274.76	0.37			0.37	275.13	24.76	3.10	303
Weed Control (Roundup)	60HPTractor & Weed Sprayer	Nov	0.33	6.24		1.26	0.92	0.36	4.36			12.77	0.46			0.46	13.24	1.19	3.83	18
Fertilize-Soil Program	use irrigation	Nov		10.00								10.00					10.00	0.90		11
Steel Line Posts	60HPTractor & Trailer	Dec	0.46	949.57		1.76	1.59	0.51	6.07	18.00	171.00	1,129.99	0.85			0.85	1,130.84	93.29	7.00	1,231
Steel End Posts	60HPTractor & Trailer	Dec	0.46	858.00		1.76	1.59	0.51	6.07	11.00	104.50	971.92	0.85			0.85	972.77	80.25	7.00	1,060
String wire	60HPTractor	Dec	0.44	79.36		1.68	0.71	0.48	5.81	13.50	128.25	215.81	0.36			0.36	216.17	17.83	2.96	237
Training Stakes	60HPTractor & Trailer	Dec	0.46	118.14		1.76	1.59	0.51	6.07	22.00	209.00	336.56	0.85			0.85	337.41	27.84	7.00	372
Gopher Bait-Strychine	Manual Labor	Feb		14.75						3.00	28.50	43.25					43.25	2.92		46
Grape Plant	60HPTractor & Trailer	Mar	0.33	3,747.90		1.26	1.14	0.36	4.36	69.68	661.96	4,416.62	0.61			0.61	4,417.23	265.03	5.02	4,687
Squirrel Bait-Diphacinone	Manual Labor	Mar		5.40						0.30	2.85	8.25					8.25	0.50		9
Mow Cover Crop	60HPTractor & Mower	Mar	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.44	4.46	12
Fertilize-Soil Program	use irrigation	Mar		10.00								10.00					10.00	0.60		11
Mow Cover Crop	60HPTractor & Mower	Apr	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.38	4.46	12
Sharp Shooter Control- Adm	applied through the irrigation	Apr		152.48								152.48					152.48	8.01		160
Gopher Bait-Strychine	Manual Labor	May		14.75						3.00	28.50	43.25					43.25	1.95		45
Train & Sucker	Manual Labor	May		14.90						13.43	127.59	142.49					142.49	6.41		149
Mow Cover Crop	60HPTractor & Mower	May	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.33	4.46	12
Weed Control (Roundup)	60HPTractor & Weed Sprayer	May	0.33	6.24		1.26	0.92	0.36	4.36			12.77	0.46			0.46	13.24	0.60	3.83	18
Mow Cover Crop	60HPTractor & Mower	Jun	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.27	4.46	12
Squirrel Bait-Diphacinone	Manual Labor	Jul		5.40						0.30	2.85	8.25					8.25	0.25		8
Train & Sucker	Manual Labor	Jul								13.43	127.59	127.59					127.59	3.83		131
Weed Control (Roundup)	60HPTractor & Weed Sprayer	Jul	0.33	6.24		1.26	0.92	0.36	4.36			12.77	0.46			0.46	13.24	0.40	3.83	17
Fertilize-Soil Program	use irrigation	Oct		10.00								10.00					10.00	0.08		10
Tie Green Tape	Manual Labor	Oct								13.43	127.59	127.59					127.59	0.96		129
Cover Crop	60HPTractor & Grass Seeder	Oct	0.40	105.00		1.53	1.76	0.44	5.28			113.57	0.90			0.90	114.47	0.86	7.40	123
Water Costs & Manual Labo	Drip Irrigation	Apr - Sep		180.00						3.35	31.83	211.83					211.83	5.40		217
Pickup		Annually	3.00			10.42	19.00	3.30	39.60			69.02	8.67			8.67	77.69	3.79	71.67	153
Office Expenses	Utl., Legal, Office Sup. Etc.														120	120.00	120.00	5.85		126
Liability Insurance													20.45			20.45	20.45	0.92		21
Land Rent													158.00			158.00	158.00	8.89	1,027	1,194
Building													2.49	6.75		9.24	9.24	0.47	22.98	33
Tools													0.62	1.69		2.31	2.31	0.12	5.75	8
Fuel Tanks & Pumps													0.71	1.91		2.62	2.62	0.13	6.51	9
Sanitation Costs													0.65	1.76		2.40	2.40	0.12	5.97	8
Drip Irrigation													18.26	49.50		67.76	67.76	3.44	169	240
TOTAL COSTS FOR THE YEAR			8	6,334	1,375	31	35	9	110	200	1,904	9,789	218	62	120	400	10,188	682	1,377	12,248

Abbreviations are as follows:

MHRS-Machinery Hours; MAT-Material Cost; F&L-Fuel and Lube Cost; MR-Machinery and Equipment Repair Cost;
MLHRS-Machinery Labor Hours; MLC-Machinery Labor Cost; HLHRS-Hand Labor Hours; HLC-Hand Labor Cost;
T&I-Taxes and Insurance; IR-Investment Repair; IOC-Interest on Operating Capital and Cash Overhead;
Dep. & Int.-Depreciation and Interest (Capital Recovery Method)

Appendix Table C. First-Year Vineyard Establishment Costs per Acre
Based on 20-Acre Vineyard and 30-Years Life of Orchard
Temecula, California 2002

	Description of Cultural Practice	Input Unit	Quant/ Acre	$/ Unit	$/ Acre	Your Cost Per Acre
I. OPERATING (CASH) COSTS (Materials, Labor, Fuel, Lube, & Repair)						
A. Cultural Costs (preharvest)						
Grade & Rip						
Grade & Rip	Custom	Acre	1.00	1,300.00	1,300.00	----------
Survey & Mark						
Wooden Stakes	Material	Stake	15.00	1.00	15.00	----------
Plastic Knifes	Material	Knife	806.00	0.03	24.18	----------
Survey & Mark	Flat Charge	Acre	1.00	75.00	75.00	----------
Wooden Stakes	Manual Labor	Hour	2.50	9.50	23.75	----------
Plastic Knifes	Manual Labor	Hour	13.50	9.50	128.25	----------
Steel Line Posts						
Steel Line Posts	Material	Post	269.00	3.50	941.50	----------
Line Post Clips	Material	Clip	269.00	0.03	8.07	----------
Install Steel Line Posts & Clips	Manual Labor	Hour	18.00	9.50	171.00	----------
Steel End Posts						
Steel End Posts	Material	Post	66.00	13.00	858.00	----------
Spread Steel End Posts	Manual Labor	Hour	11.00	9.50	104.50	----------
String wire						
Cordon Wire	Material	Foot	4,836.00	0.0103	49.86	----------
Drip Wire	Material	Foot	4,836.00	0.0061	29.50	----------
String Wire Installation	Manual Labor	Hour	13.50	9.50	128.25	----------
Training Stakes						
Training Stakes	Material	Stake	537.00	0.19	102.03	----------
Training Stake Clip	Material	Clip	537.00	0.03	16.11	----------
Install Training Stakes & Clips	Manual Labor	Hour	22.00	9.50	209.00	----------
Plant Vine						
Grape Plant	Material	Plant	806.00	4.00	3,224.00	----------
Grow Tube	Material	Tube	806.00	0.65	523.90	----------
Grape Plant	Manual Labor	Hour	69.68	9.50	661.96	----------
Pest & Disease Control						
Gopher Bait-Strychine						
Gopher Bait-Strychine	Material-2X	Pound	5.00	5.90	29.50	----------
Gopher Bait-Strychine	Manual Labor-2X	Hour	6.00	9.50	57.00	----------
Squirrel Bait-Diphacinone						
Squirrel Bait-Diphacinone	Material-2X	Pound	6.00	1.80	10.80	----------
Squirrel Bait-Diphacinone	Manual Labor-2X	Hour	0.60	9.50	5.70	----------
Sharp Shooter Control- Admire						
Sharp Shooter Control- Admire	applied through the irrigatio	Oz	32.00	4.77	152.48	----------
Weed Control						
Weed Control	Post-Emerging Herb.-3X	Quart	1.50	12.48	18.72	----------
Train & Tie & Sucker						
Tie Green Tape	Material	Rolls	10.00	1.49	14.90	----------
Train & Sucker	Manual Labor-2X	Hour	26.86	9.50	255.17	----------
Tie Green Tape	Manual Labor	Hour	13.43	9.50	127.59	----------
Fertilize						
Fertilize-Soil Program	through the irrigation - 3X	Acre	1.00	30.00	30.00	----------
Cover Crop						
Clover	Material	Pound	20.00	5.25	105.00	----------
Water Costs & Manual Labor						
Irrigate	Water Costs	Ac.Ft	0.50	360.00	180.00	----------
Irrigate	Manual Labor	Hour	3.35	9.50	31.83	----------
B. Machinery Costs (Fuel, Lube, & Repair)						
Labor		Hour	9.15	12.00	109.82	----------
Fuel & Lube					30.77	----------
Machinery Repair					35.46	----------
TOTAL OPERATING COSTS					**9,789**	----------
II. CASH OVERHEAD COSTS						
Office Expenses					120.00	----------
Taxes & Insurance					197.73	----------
Liability Insurance					20.45	----------
Investment Repair					61.61	----------
TOTAL CASH OVERHEAD COSTS					**400**	----------
Interest on Operating Capital and Cash Overhead					**682**	----------
III. NON-CASH OVERHEAD COSTS (Depreciation & Interest)						
Land Rent					1,027.00	----------
Building					22.98	----------
Tools					5.75	----------
Fuel Tanks & Pumps					6.51	----------
Sanitation Costs					5.97	----------
Drip Irrigation					168.52	----------
Depr. & Interest					140.49	----------
TOTAL NON-CASH OVERHEAD COSTS					**1,377**	----------
TOTAL COSTS FOR THE YEAR					**12,248**	----------

Appendix Table D. Schedule of Second-Year Vineyard Establishment Operations and Costs per Acre
Based on 20-Acre Vineyard and 30-Years Life of Orchard
Temecula, California 2002

Operation	Method of Application	Month	Cash Costs										Cash Overhead Costs				Total Cash	IOC	Dep. &	Total
			MHRS	MAT	Custom	F&L	MR	MLHRS	MLC	HLHRS	HLC	Total	T&I	IR	Other	Total	Costs		Int.	Costs
				(A)	(B)	(C)	(D)		(E)		(F)	(G)=(A)+(B)+ (C)+(D)+(E)+(F)	(H)	(I)	(J)	(K)=(H)+ (I)+(J)	(L)= (G)+(K)	(M)	(N)	(O)=(L)+ (M)+(N)
Weed Control (Roundup)	60HPTractor & Weed S	Nov	0.33	6.24		1.26	0.92	0.36	4.36			13	0.46			0.46	13.24	1.19	3.83	18.26
Fertilize-Soil Program	use irrigation	Nov		10.00								10					10.00	0.90		10.90
String wire	60HPTractor	Dec	0.88	153.40		1.68	0.71	0.48	5.81	27.00	256.50	418	0.36			0.36	418.46	34.52	2.96	455.94
Gopher Bait-Strychine	Manual Labor	Feb		14.75						3.00	28.50	43					43.25	2.92		46.17
Grape Plant (10% replant)	60HPTractor & Trailer	Mar	0.03	322.40		0.13	0.11	0.04	0.44	6.97	66.20	389	0.06			0.06	389.33	23.36	0.50	413.19
Squirrel Bait-Diphacinone	Manual Labor	Mar		5.40						0.30	2.85	8					8.25	0.50		8.75
Mow Cover Crop	60HPTractor & Mower	Mar	0.33			1.26	1.14	0.36	4.36			7	0.54			0.54	7.30	0.44	4.46	12.20
Fertilize-Soil Program	use irrigation	Mar		10.00								10					10.00	0.60		10.60
Mow Cover Crop	60HPTractor & Mower	Apr	0.33			1.26	1.14	0.36	4.36			7	0.54			0.54	7.30	0.38	4.46	12.15
Sharp Shooter Control- Admire	applied through the irrig	Apr		152.48								152					152.48	8.01		160.49
Gopher Bait-Strychine	Manual Labor	May		14.75						3.00	28.50	43					43.25	1.95		45.20
Train & Sucker	Manual Labor	May		14.90						13.43	127.59	142					142.49	6.41		148.90
Mow Cover Crop	60HPTractor & Mower	May	0.33			1.26	1.14	0.36	4.36			7	0.54			0.54	7.30	0.33	4.46	12.09
Weed Control (Roundup)	60HPTractor & Weed S	May	0.33	6.24		1.26	0.92	0.36	4.36			13	0.46			0.46	13.24	0.60	3.83	17.67
Mow Cover Crop	60HPTractor & Mower	Jun	0.33			1.26	1.14	0.36	4.36			7	0.54			0.54	7.30	0.27	4.46	12.04
Squirrel Bait-Diphacinone	Manual Labor	Jul		5.40						0.30	2.85	8					8.25	0.25		8.50
Train & Sucker	Manual Labor	Jul								13.43	127.59	128					127.59	3.83		131.41
Weed Control (Roundup)	60HPTractor & Weed S	Jul	0.33	6.24		1.26	0.92	0.36	4.36			13	0.46			0.46	13.24	0.40	3.83	17.47
Tie Green Tape	Manual Labor	Oct								13.43	127.59	128					127.59	0.96		128.54
Fertilize-Soil Program	use irrigation	Oct		10.00								10					10.00	0.08		10.08
Cover Crop	60HPTractor & Grass S	Oct	0.40	105.00		1.53	1.76	0.44	5.28			114	0.90			0.90	114.47	0.86	7.40	122.72
Water Costs & Manual Labor	Drip Irrigation	Apr - Sep		360.00						3.35	31.83	392					391.83	9.99		401.82
Pickup		Annually	3.00			10.42	19.00	3.30	39.60			69	8.67			8.67	77.69	3.79	71.67	153.15
Office Expenses	Utl., Legal, Office Sup. Etc.														120.00	120.00	120.00	5.85		125.85
Liability Insurance													20.45			20.45	20.45	0.92		21.37
Property and Insurance Taxes on Orchard Value													90.23			90.23	90.23	5.08		90.23
Interest on Establishment															1,102.32	1,102.32	1,102.32			1,107
Land Rent													158.00			158.00	158.00	8.89	1,027.00	1,194
Building													2.49	6.75		9.24	9.24	0.47	22.98	32.69
Tools													0.62	1.69		2.31	2.31	0.12	5.75	8.17
Fuel Tanks & Pumps													0.71	1.91		2.62	2.62	0.13	6.51	9.26
Sanitation Costs													0.65	1.76		2.40	2.40	0.12	5.97	8.50
Drip Irrigation													18.26	49.50		67.76	67.76	3.44	168.52	239.72
TOTAL COSTS FOR THE YEAR			7	1,197	0	23	29	7	82	84	800	2,130	305	62	1,222	1,589	3,719	128	1,349	5,195

Note: Abbreviations are explained in Appendix Table C.

Appendix Table E. Second-Year Vineyard Establishment Costs per Acre
Based on 20-Acre Vineyard and 30-Years Life of Orchard
Temecula, California 2002

	Description of Cultural Practice	Input Unit	Quant/ Acre	$/ Unit	$/ Acre	Your Cost Per Acre
I. OPERATING (CASH) COSTS (Materials, Labor, Fuel, Lube, & Repair)						
A. Cultural Costs (preharvest)						
String wire						
Catch Wire	Material	Foot	19,344.00	0.0079	153.40	----------
String Wire Installation	Manual Labor	Hour	27.00	9.50	256.50	----------
Plant Vine						
Grape Plant (10% replant)	Material	Plant	80.60	4.00	322.40	----------
Grape Plant	Manual Labor	Hour	6.97	9.50	66.20	----------
Pest & Disease Control						
Gopher Bait-Strychine						
Gopher Bait-Strychine	Material-2X	Pound	5.00	5.90	29.50	----------
Gopher Bait-Strychine	Manual Labor-2X	Hour	6.00	9.50	57.00	----------
Squirrel Bait-Diphacinone						
Squirrel Bait-Diphacinone	Material-2X	Pound	6.00	1.80	10.80	----------
Squirrel Bait-Diphacinone	Manual Labor-2X	Hour	0.60	9.50	5.70	----------
Sharp Shooter Control- Admire						----------
Sharp Shooter Control- Admire	applied through the irrigatio	Oz	32.00	4.77	152.48	----------
Weed Control						
Weed Control (Roundup)	Post-Emerging Herb.-3X	Quart	1.50	12.48	18.72	----------
Train & Tie & Sucker						
Tie Green Tape	Material	Rolls	10.00	1.49	14.90	----------
Train & Sucker	Manual Labor-2X	Hour	26.86	9.50	255.17	----------
Tie Green Tape	Manual Labor	Hour	13.43	9.50	127.59	----------
Fertilize						
Fertilize-Soil Program	through the irrigation - 3X	Acre	1.00	30.00	30.00	----------
Cover Crop						
Clover	Material	Pound	20.00	5.25	105.00	----------
Water Costs & Manual Labor						
Irrigate	Water Costs	Ac.Ft	1.00	360.00	360.00	----------
Irrigate	Manual Labor	Hour	3.35	9.50	31.83	----------
B. Machinery Costs (Fuel, Lube, & Repair)						
Labor		Hour	6.80	12.00	81.62	----------
Fuel & Lube					22.60	----------
Machinery Repair					28.91	----------
TOTAL OPERATING COSTS					**2,130**	----------
II. CASH OVERHEAD COSTS						
Office Expenses					120.00	----------
Taxes & Insurance					284.49	----------
Liability Insurance					20.45	----------
Investment Repair					61.61	----------
Interest on Establishment					1,102.32	----------
TOTAL CASH OVERHEAD COSTS					**1589**	----------
Interest on Operating Capital and Cash Overhead					**128**	----------
III. NON-CASH OVERHEAD COSTS (Depreciation & Interest)						
Land Rent					1,027.00	----------
Building					22.98	----------
Tools					5.75	----------
Fuel Tanks & Pumps					6.51	----------
Sanitation Costs					5.97	----------
Drip Irrigation					168.52	----------
Depr. & Interest					111.88	----------
TOTAL NON-CASH OVERHEAD COSTS					**1,349**	----------
TOTAL COSTS FOR THE YEAR					**5,195**	----------

Appendix Table F. Schedule of Third-Year Vineyard Establishment Operations and Costs per Acre
Based on 20-Acre Vineyard and 30-Years Life of Orchard
Temecula, California 2002

Operation	Method of Application	Month	Cash Costs										Cash Overhead Costs				Total Cash	IOC	Dep. &	Total
			MHRS	MAT	Custom	F&L	MR	MLHRS	MLC	HLHRS	HLC	Total	T&I	IR	Other	Total	Costs		Int.	Costs
				(A)	(B)	(C)	(D)		(E)		(F)	(G)=(A)+(B)+(C)+(D)+(E)+(F)	(H)	(I)	(J)	(K)=(H)+(I)+(J)	(L)=(G)+(K)	(M)	(N)	(O)=(L)+(M)+(N)
Weed Control (Roundup)	60HPTractor & Weed Spray	Nov	0.33	6.24		1.26	0.92	0.36	4.36			12.77	0.46			0.46	13.24	1.19	3.83	18.26
Fertilize-Soil Program	use irrigation	Nov		25.00								25.00					25.00	2.25		27.25
Gopher Bait-Strychine	Manual Labor	Feb		14.75						3.00	28.50	43.25					43.25	2.92		46.17
Prune	Manual Labor	Feb	0.33			1.26	1.14	0.36	4.36	33.58	319.04	325.80	0.54			0.54	326.34	22.03	4.46	352.83
Mow Cover Crop	60HPTractor & Mower	Mar	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.44	4.46	12.20
Fertilize-Soil Program	use irrigation	Mar		25.00								25.00					25.00	1.50		26.50
Fertilize-Foliar Program	60HPTractor & Orchard Sp	Mar	0.99	76.50		3.79	13.15	1.09	13.07			106.51	3.97			3.97	110.48	6.63	32.80	149.91
Squirrel Bait-Diphacinone	Manual Labor	Mar		5.40						0.30	2.85	8.25					8.25	0.50		8.75
Mow Cover Crop	60HPTractor & Mower	Apr	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.38	4.46	12.15
Pest & Disease (Dry Sulfur)	60HPTractor & Duster	Apr	0.46	8.40		1.76	2.49	0.51	6.07			18.72	0.57			0.57	19.29	1.01	5.32	25.63
Pest & Disease (Micronized Sul	60HPTractor & Duster	Apr	0.46	1.20		1.76	2.49	0.51	6.07			11.52	0.57			0.57	12.09	0.63	5.32	18.05
Sharp Shooter Control- Admire	applied through the irrigatic	Apr		152.48								152.48					152.48	8.01		160.49
Gopher Bait-Strychine	Manual Labor	May		14.75						3.00	28.50	43.25					43.25	1.95		45.20
Mow Cover Crop	60HPTractor & Mower	May	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.33	4.46	12.09
Shoot Thin	Manual Labor	May								53.73	510.44	510.44					510.44	22.97		533.40
Weed Control (Roundup)	60HPTractor & Weed Spray	May	0.33	6.24		1.26	0.92	0.36	4.36			12.77	0.46			0.46	13.24	0.60	3.83	17.67
Pest & Disease (Dry Sulfur)	60HPTractor & Duster	May	0.46	8.40		1.76	2.49	0.51	6.07			18.72	0.57			0.57	19.29	0.87	5.32	25.48
Pest & Disease (Micronized Sul	60HPTractor & Duster	May	0.46	1.20		1.76	2.49	0.51	6.07			11.52	0.57			0.57	12.09	0.54	5.32	17.96
Pest & Disease (Dry Sulfur)	60HPTractor & Duster	May	0.46	8.40		1.76	2.49	0.51	6.07			18.72	0.57			0.57	19.29	0.87	5.32	25.48
Pest & Disease (Micronized Sul	60HPTractor & Duster	May	0.46	1.20		1.76	2.49	0.51	6.07			11.52	0.57			0.57	12.09	0.54	5.32	17.96
Mow Cover Crop	60HPTractor & Mower	Jun	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.27	4.46	12.04
Pest & Disease (Dry Sulfur)	60HPTractor & Duster	Jun	0.46	8.40		1.76	2.49	0.51	6.07			18.72	0.57			0.57	19.29	0.72	5.32	25.34
Pest & Disease (Micronized Sul	60HPTractor & Duster	Jun	0.46	1.20		1.76	2.49	0.51	6.07			11.52	0.57			0.57	12.09	0.45	5.32	17.87
Weed Control (Roundup)	60HPTractor & Weed Spray	Jul	0.33	6.24		1.26	0.92	0.36	4.36			12.77	0.46			0.46	13.24	0.40	3.83	17.47
Pest & Disease (Dry Sulfur)	60HPTractor & Duster	Jul	0.46	8.40		1.76	2.49	0.51	6.07			18.72	0.57			0.57	19.29	0.58	5.32	25.20
Pest & Disease (Micronized Sul	60HPTractor & Duster	Jul	0.46	1.20		1.76	2.49	0.51	6.07			11.52	0.57			0.57	12.09	0.36	5.32	17.78
Squirrel Bait-Diphacinone	Manual Labor	Jul		5.40						0.30	2.85	8.25					8.25	0.25		8.50
Picking	25% of harvest	Aug			55.00							55.00					55.00	1.24		56.24
Hauling	25% of harvest	Aug			15.75							15.75					15.75	0.35		16.10
Picking	50% of harvest	Sep			110.00							110.00					110.00	1.65		111.65
Hauling	50% of harvest	Sep			31.50							31.50					31.50	0.47		31.97
Picking	25% of harvest	Oct			55.00							55.00					55.00	0.41		55.41
Hauling	25% of harvest	Oct			15.75							15.75					15.75	0.12		15.87
Tie Green Tape	Manual Labor	Oct		14.90						13.43	127.62	142.52					142.52	1.07		143.59
Fertilize-Soil Program	use irrigation	Oct		25.00								25.00					25.00	0.19		25.19
Fertilize-Foliar Program	60HPTractor & Orchard Sp	Oct	0.99	76.50		3.79	13.15	1.09	13.07			106.51	3.97			3.97	110.48	0.83	32.80	144.11
Cover Crop	60HPTractor & Grass Seed	Oct	0.40	105.00		1.53	1.76	0.44	5.28			111.81	0.90			0.90	112.71	0.85	7.40	120.95
Water Costs & Manual Labor	Drip Irrigation	Apr - Sep		540.00						3.35	31.83	571.83					571.83	14.58		586.41
Pickup		Annually	3.00			10.42	19.00	3.30	39.60			69.02	8.67			8.67	77.69	3.79	71.67	153.15
Office Expenses	Utl., Legal, Office Sup. Etc.														120.00	120.00	120.00	5.85		125.85
Liability Insurance													20.45			20.45	20.45	0.92		21.37
Property and Insurance Taxes on Orchard Value													122.16			122.16	122.16	6.87		129.03
Interest on Establishment															1,569.90	1569.90	1569.90			1569.90
Land Rent													158.00			158.00	158.00	8.89	1027.00	1193.89
Building													2.49	6.75		9.24	9.24	0.47	22.98	32.69
Tools													0.62	1.69		2.31	2.31	0.12	5.75	8.17
Fuel Tanks & Pumps													0.71	1.91		2.62	2.62	0.13	6.51	9.26
Sanitation Costs													0.65	1.76		2.40	2.40	0.12	5.97	8.50
Drip Irrigation													18.26	49.50		67.76	67.76	3.44	168.52	239.72
TOTAL COSTS FOR THE YEAR			13	1,147	283	47	80	14	167	111	1,052	2,776	351	62	1,690	2,102	4,878	128	1,468	6,475
LESS INCOME FROM PRODUCTION																				-2,563
TOTAL NET COSTS FOR THE YEAR																				3,912

Note: Abbreviations are explained in Appendix Table C.

Appendix Table G. Third-Year Vineyard Establishment Costs per Acre
Based on 20-Acre Vineyard and 30-Years Life of Orchard
Temecula, California 2002

	Description of Cultural Practice	Input Unit	Quant/ Acre	$/ Unit	$/ Acre	Your Cost Per Acre
I. OPERATING (CASH) COSTS (Materials, Labor, Fuel, Lube, & Repair)						
A. Cultural Costs (preharvest)						
Prune						
Prune	Manual Labor	Hour	33.58	9.50	319.04	----------
Pest & Disease Control						
Gopher Bait-Strychine						
Gopher Bait-Strychine	Material-2X	Pound	5.00	5.90	29.50	----------
Gopher Bait-Strychine	Manual Labor-2X	Hour	6.00	9.50	57.00	----------
Squirrel Bait-Diphacinone						
Squirrel Bait-Diphacinone	Material-2X	Pound	6.00	1.80	10.80	----------
Squirrel Bait-Diphacinone	Manual Labor-2X	Hour	0.60	9.50	5.70	----------
Sharp Shooter Control- Admire						
Sharp Shooter Control- Admire	applied through the irrigatic	Oz	32.00	4.77	152.48	----------
Pest & Disease (Dry Sulfur)						
Pest & Disease (Dry Sulfur)	Material-5X	Pound	50.00	0.84	42.00	----------
Pest & Disease (Micronized Sulfur)						
Pest & Disease (Micronized Sulfur)	Material-5X	Pound	30.00	0.20	6.00	----------
Weed Control						
Weed Control (Roundup)	Post-Emerging Herb.-3X	Quart	1.50	12.48	18.72	----------
Tie Green Tape						
Tie Green Tape	Material	Rolls	10.00	1.49	14.90	----------
Tie Green Tape	Manual Labor	Hour	13.43	9.50	127.62	----------
Shoot Thin						
Shoot Thin	Manual Labor	Hour	53.73	9.50	510.44	----------
Fertilize						
Fertilize-Soil Program	through the irrigation - 3X	Acre	1.00	75.00	75.00	----------
Fertilize-Foliar Program	Spray-6X	Acre	1.00	153.00	153.00	----------
Cover Crop						
Clover	Material	Pound	20.00	5.25	105.00	----------
Water Costs & Manual Labor						
Irrigate	Water Costs	Ac.Ft	1.50	360.00	540.00	----------
Irrigate	Manual Labor	Hour	3.35	9.50	31.83	----------
B. Machinery Costs (Fuel, Lube, & Repair)						
Labor		Hour	13.88	12.00	166.58	----------
Fuel & Lube					47.22	----------
Machinery Repair					80.41	----------
C. Harvest Costs						
Picking		Ton	2.00	110.00	220.00	----------
Hauling		Ton	2.00	15.00	30.00	----------
Forklift-Rental		Acre	1.00	33.00	33.00	----------
TOTAL OPERATING COSTS					**2,776**	----------
II. CASH OVERHEAD COSTS						
Office Expenses					120.00	----------
Taxes & Insurance					330.22	----------
Liability Insurance					20.45	----------
Investment Repair					61.61	----------
Interest on Establishment					1,569.90	----------
TOTAL CASH OVERHEAD COSTS					**2,102**	----------
Interest on Operating Capital and Cash Overhead					**128**	----------
III. NON-CASH OVERHEAD COSTS (Depreciation & Interest)						
Land Rent					1,027.00	----------
Building					22.98	----------
Tools					5.75	----------
Fuel Tanks & Pumps					6.51	----------
Sanitation Costs					5.97	----------
Drip Irrigation					168.52	----------
Depr. & Interest	Equipment				231.72	----------
TOTAL NON-CASH OVERHEAD COSTS					**1,468**	----------
TOTAL COSTS FOR THE YEAR					**6,475**	----------
LESS INCOME FROM PRODUCTION		**Ton**	**2.50**	**1,025**	**-2,563**	----------
TOTAL NET COSTS FOR THE YEAR					**3,912**	----------

Appendix Table H. Production-Year Wine Grape Operations and Costs per Acre
Based on 20-Acre Vineyard and 30-Years Life of Orchard
Temecula, California 2002

Operation	Method of Application	Month	Cash Costs: MHRS	MAT (A)	Custom (B)	F&L (C)	MR (D)	MLHRS	MLC (E)	HLHRS	HLC (F)	Total (G)=(A)+(B)+(C)+(D)+(E)+(F)	Cash Overhead Costs: T&I (H)	IR (I)	Other (J)	Total (K)=(H)+(I)+(J)	Total Cash Costs (L)=(G)+(K)	IOC (M)	Dep. & Int. (N)	Total Costs (O)=(L)+(M)+(N)
Fertilize-Soil Program	use irrigation	Nov		25.00								25.00					25.00	2.25		27.25
Prune	Manual Labor	Feb	0.33			1.26	1.14	0.36	4.36	47.02	446.66	453.42	0.54			0.54	453.96	30.64	4.46	489.07
Gopher Bait-Strychine	Manual Labor	Feb		14.75						3.00	28.50	43.25					43.25	2.92		46.17
Mow Cover Crop	60HPTractor & Mower	Mar	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.44	4.46	12.20
Fertilize-Soil Program	use irrigation	Mar		25.00								25.00					25.00	1.50		26.50
Fertilize-Foliar Program	60HPTractor & Orchard Sp	Mar	0.99	76.50		3.79	13.15	1.09	13.07			106.51	3.97			3.97	110.48	6.63	32.80	149.91
Squirrel Bait-Diphacinone	Manual Labor	Mar		5.40						0.30	2.85	8.25					8.25	0.50		8.75
Mow Cover Crop	60HPTractor & Mower	Apr	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.38	4.46	12.15
Pest & Disease (Dry Sulfur)	60HPTractor & Duster	Apr	0.46	8.40		1.76	2.49	0.51	6.07			18.72	0.57			0.57	19.29	1.01	5.32	25.63
Pest & Disease (Micronized Sulfu	60HPTractor & Duster	Apr	0.46	1.20		1.76	2.49	0.51	6.07			11.52	0.57			0.57	12.09	0.63	5.32	18.05
Pest & Disease (Dry Sulfur)	60HPTractor & Duster	Apr	0.46	8.40		1.76	2.49	0.51	6.07			18.72	0.57			0.57	19.29	1.01	5.32	25.63
Pest & Disease (Micronized Sulfu	60HPTractor & Duster	Apr	0.46	1.20		1.76	2.49	0.51	6.07			11.52	0.57			0.57	12.09	0.63	5.32	18.05
Pest & Disease (Dry Sulfur)	60HPTractor & Duster	Apr	0.46	8.40		1.76	2.49	0.51	6.07			18.72	0.57			0.57	19.29	1.01	5.32	25.63
Pest & Disease (Micronized Sulfu	60HPTractor & Duster	Apr	0.46	1.20		1.76	2.49	0.51	6.07			11.52	0.57			0.57	12.09	0.63	5.32	18.05
Sharp Shooter Control- Admire	applied through the irrigatio	Apr		152.48								152.48					152.48	8.01		160.49
Gopher Bait-Strychine	Manual Labor	May		14.75						3.00	28.50	43.25					43.25	1.95		45.20
Mow Cover Crop	60HPTractor & Mower	May	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.33	4.46	12.09
Shoot Thin	Manual Labor	May								53.73	510.44	510.44					510.44	22.97		533.40
Weed Control (Roundup)	60HPTractor & Weed Spra	May	0.33	6.24		1.26	0.92	0.36	4.36			12.77	0.46			0.46	13.24	0.60	3.83	17.67
Pest & Disease (Dry Sulfur)	60HPTractor & Duster	Jun	0.46	8.40		1.76	2.49	0.51	6.07			18.72	0.57			0.57	19.29	0.72	5.32	25.34
Pest & Disease (Micronized Sulfu	60HPTractor & Duster	Jun	0.46	1.20		1.76	2.49	0.51	6.07			11.52	0.57			0.57	12.09	0.45	5.32	17.87
Mow Cover Crop	60HPTractor & Mower	Jun	0.33			1.26	1.14	0.36	4.36			6.76	0.54			0.54	7.30	0.27	4.46	12.04
Pest & Disease (Dry Sulfur)	60HPTractor & Duster	Jul	0.46	8.40		1.76	2.49	0.51	6.07			18.72	0.57			0.57	19.29	0.58	5.32	25.20
Pest & Disease (Micronized Sulfu	60HPTractor & Duster	Jul	0.46	1.20		1.76	2.49	0.51	6.07			11.52	0.57			0.57	12.09	0.36	5.32	17.78
Squirrel Bait-Diphacinone	Manual Labor	Jul		5.40						0.30	2.85	8.25					8.25	0.25		8.50
Weed Control (Roundup)	60HPTractor & Weed Spra	Jul	0.33	6.24		1.26	0.92	0.36	4.36			12.77	0.46			0.46	13.24	0.40	3.83	17.47
Picking	25% of harvest	Aug			165.00							165.00					165.00	3.71		168.71
Hauling	25% of harvest	Aug			22.50							22.50					22.50	0.51		23.01
Forklift-Rental	25% of harvest	Aug			8.25							8.25					8.25	0.19		8.44
Picking	50% of harvest	Sep			330.00							330.00					330.00	4.95		334.95
Hauling	50% of harvest	Sep			45.00							45.00					45.00	0.68		45.68
Forklift-Rental	50% of harvest	Sep			16.50							16.50					16.50	0.25		16.75
Picking	25% of harvest	Oct			165.00							165.00					165.00	1.24		166.24
Hauling	25% of harvest	Oct			22.50							22.50					22.50	0.17		22.67
Forklift-Rental	25% of harvest	Oct			8.25							8.25					8.25	0.00		8.25
Tie Green Tape	Manual Labor	Oct		14.90						13.43	127.62	142.52					142.52	1.07		143.59
Weed Control (Karmex)	60HPTractor & Weed Spra	Oct	0.33	1.71		1.26	0.92	0.36	4.36			8.25	0.46			0.46	8.71	0.07	3.83	12.61
Fertilize-Soil Program	use irrigation	Oct		25.00								25.00					25.00	0.19		25.19
Fertilize-Foliar Program	60HPTractor & Orchard Sp	Oct	0.99	76.50		3.79	13.15	1.09	13.07			106.51	3.97			3.97	110.48	0.83	32.80	144.11
Cover Crop	60HPTractor & Grass Seed	Oct	0.40	105.00		1.53	1.76	0.44	5.28			111.81	0.90			2.66	114.47	0.86	7.40	122.72
Water Costs & Manual Labor	Drip Irrigation	Apr - Sep		720.00						3.35	31.83	751.83					751.83	23.68		775.51
Pickup		Annually	3.00			10.42	19.00	3.30	39.60			69.02	8.67			8.67	77.69	3.79	71.67	153.15
Office Expenses	Utl., Legal, Office Sup. Etc.														120	120.00	120.00	5.85		125.85
Liability Insurance													20.45			20.45	20.45	0.92		21.37
Property and Insurance Taxes on Orchard Value													142.44			142.44	142.44	8.01		150.45
Land Rent													158.00			158.00	158.00	8.89	1,027.00	1193.89
Building													2.49	6.75		9.24	9.24	0.47	22.98	32.69
Tools													0.62	1.69		2.31	2.31	0.12	5.75	8.17
Fuel Tanks & Pumps													0.71	1.91		2.62	2.62	0.13	6.51	9.26
Sanitation Costs													0.65	1.76		2.40	2.40	0.12	5.97	8.50
Drip Irrigation													18.26	49.50		67.76	67.76	3.44	168.52	239.72
Amortized Tree Establishment Cost													177.25			177.25	177.25	9.97	1,699.92	1887.14
Total of All Costs Excluding Management			13	1,323	783	47	80	14	167	124	1,179	3,578	548	62	120	732	4,309	167	3,168	7,645
LESS INCOME FROM PRODUCTION																				-6,150
TOTAL NET COSTS FOR THE YEAR																				1,495

Note: Abbreviations are explained in Appendix Table C.

Appendix Table I. Production-Year Wine Grape Input Costs per Acre
Based on 20-Acre Vineyard and 30-Years Life of Orchard
Temecula, California 2002

	Description of Cultural Practice	Input Unit	Quant/ Acre	$/ Unit	$/ Acre	Your Cost Per Acre
I. OPERATING (CASH) COSTS (Materials, Labor, Fuel, Lube, & Repair)						
A. Cultural Costs (preharvest)						
Prune						
Prune	Manual Labor	Hour	47.02	9.50	446.66	----------
Pest & Disease Control						
Gopher Bait-Strychine						
Gopher Bait-Strychine	Material-2X	Pound	5.00	5.90	29.50	----------
Gopher Bait-Strychine	Manual Labor-2X	Hour	6.00	9.50	57.00	----------
Squirrel Bait-Diphacinone						
Squirrel Bait-Diphacinone	Material-2X	Pound	6.00	1.80	10.80	----------
Squirrel Bait-Diphacinone	Manual Labor-2X	Hour	0.60	9.50	5.70	----------
Sharp Shooter Control- Admire						
Sharp Shooter Control- Admire	applied through the irrigation	Oz	32.00	4.77	152.48	----------
Pest & Disease (Dry Sulfur)						
Pest & Disease (Dry Sulfur)	Material-5X	Pound	50.00	0.84	42.00	----------
Pest & Disease (Micronized Sulfur)						
Pest & Disease (Micronized Sulfur)	Material-5X	Pound	30.00	0.20	6.00	----------
Weed Control						
Weed Control (Roundup)	Pre-Emerging Herb.-2X	Quart	1.00	12.48	12.48	----------
Weed Control (Karmex)	Post-Emerging Herb.-1X	Pound	0.33	5.20	1.71	----------
Tie Green Tape						
Tie Green Tape	Material	Rolls	10.00	1.49	14.90	----------
Tie Green Tape	Manual Labor	Hour	13.43	9.50	127.62	----------
Shoot Thin						
Shoot Thin	Manual Labor	Hour	53.73	9.50	510.44	----------
Fertilize						
Fertilize-Soil Program	through the irrigation - 3X	Acre	1.00	75.00	75.00	----------
Fertilize-Foliar Program	Spray-6X	Acre	1.00	153.00	153.00	----------
Cover Crop						
Clover	Material	Pound	20.00	5.25	105.00	----------
Water Costs & Manual Labor						
Irrigate	Water Costs	Ac.Ft	2.00	360.00	720.00	----------
Irrigate	Manual Labor	Hour	3.35	9.50	31.83	----------
B. Machinery Costs (Fuel, Lube, & Repair)						
Labor		Hour	13.88	12.00	166.58	----------
Fuel & Lube					47.22	----------
Machinery Repair					80.41	----------
C. Harvest Costs						
Picking		Ton	6.00	110.00	660.00	----------
Hauling		Ton	6.00	15.00	90.00	----------
Forklift-Rental		Acre	1.00	33.00	33.00	----------
TOTAL OPERATING COSTS					**3,579**	----------
II. CASH OVERHEAD COSTS						
Office Expenses					120.00	----------
Taxes & Insurance					527.76	----------
Liability Insurance					20.45	----------
Investment Repair					61.61	----------
TOTAL CASH OVERHEAD COSTS					**730**	----------
Interest on Operating Capital and Cash Overhead					**167**	----------
III. NON-CASH OVERHEAD COSTS (Depreciation & Interest)						
Land Rent					1,027.00	----------
Building					22.98	----------
Tools					5.75	----------
Fuel Tanks & Pumps					6.51	----------
Sanitation Costs					5.97	----------
Drip Irrigation					168.52	----------
Depr. & Interest					231.72	----------
Amortized Tree Establishment Cost					1,699.92	----------
TOTAL NON-CASH OVERHEAD COSTS					**3,168**	----------
TOTAL COSTS FOR THE YEAR					**7,645**	----------
LESS INCOME FROM PRODUCTION		**Ton**	**6**	**1,025**	**-6,150**	----------
TOTAL NET COSTS FOR THE YEAR					**1,495**	----------