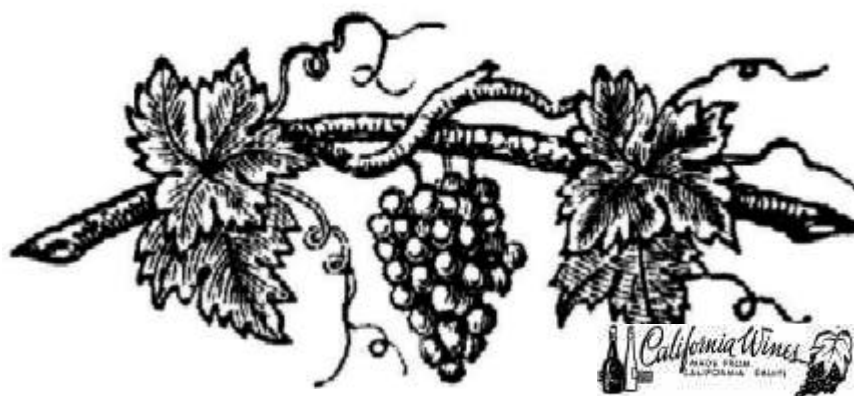

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2002

SAMPLE COSTS
TO ESTABLISH A VINEYARD AND PRODUCE
WINE GRAPES

Chardonnay



Sacramento Valley

SACRAMENTO RIVER DELTA

Sacramento and Yolo Counties – District 17

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**SAMPLE COST TO ESTABLISH A VINEYARD
AND PRODUCE WINE GRAPES
Chardonnay – Drip Irrigation
Sacramento Valley, Sacramento River Delta of
Sacramento and Yolo Counties – 2002**

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INTRODUCTION

Sample costs to establish a vineyard and produce wine grapes under drip irrigation in the Sacramento Valley – Sacramento River Delta (Sacramento and Yolo counties) are presented in this study. This study is intended as a guide only, and can be used to make production decisions, determine potential returns, prepare budgets and evaluate production loans. Practices described are based on production practices considered typical for the crop and area, but these same practices will not apply to every situation. The sample costs for labor, materials, equipment and custom services are based on current figures. A blank column, “*Your Costs*”, in Tables 2 and 3 is provided for entering your costs.

The hypothetical farm operation, production practices, overhead, and calculations are described under the assumptions. For additional information or an explanation of the calculations used in the study call the Department of Agricultural and Resource Economics, University of California, Davis, (530) 752-3589 or your local UC Cooperative Extension office.

Sample Cost of Production Studies for many commodities are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-3589. Current studies can be downloaded from the department website at <http://coststudies.ucdavis.edu> or obtained from selected county UC Cooperative Extension offices.

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ASSUMPTIONS

The assumptions refer to Tables 1 to 7 and pertain to sample costs to establish a vineyard and produce wine grapes in the Sacramento River Delta of the Sacramento Valley – Sacramento and Yolo counties (California District 17). Practices described are not University of California recommendations, but represent production practices and materials considered typical of a well managed vineyard in the region. The costs, materials, and practices shown in this study will not be applicable to all situations. Establishment and cultural practices vary by grower and the differences can be significant. *The use of trade names in this report does not constitute an endorsement or recommendation by the University of California or the Clarksburg Wine Growers Association nor is any criticism implied by omission of other similar products.*

Farm. The hypothetical farm located on the valley floor in the Sacramento River Delta of Sacramento and Yolo Counties is owned, managed and operated by the owner. The 200 contiguous acre farm consists of 135 acres of producing vineyards, 60 acres of newly planted wine grapes, and five acres occupied by roads, irrigation systems, and farmstead.

Establishment Operating Costs

(Table 1.)

Vineyard Conversion and Site Preparation. The new vineyard is being planted on land that had an existing vineyard. The old grapevines are removed in the fall. After the vines have been pushed out and burned, the land is ripped twice, 24 to 30 inches deep, to break up hardpan, improve root and water penetration and also pull up additional roots remaining from the previous vines. Afterward, the ground is disced two times. The field is laser leveled, then in a single operation disced and cultipacked. In the spring the ground is cultivated (disced) two times. Operations done in the year prior to planting are shown in the first year. Vineyard removal and ripping are done by contract or custom operators.

Vines. Potted benchgraft vines, Chardonnay variety, are planted on a 6' x 10' spacing at 726 vines per acre. Chardonnay is the predominant wine variety in the area. The Merlot variety, also planted in the area, has similar cultural practices. Vines are trained to a bilateral cordon at 44 inches and spur pruned. Cordons are the horizontal branches and spurs or shoots are the bearing units on the cordon. The grapevines are assumed to begin yielding fruit in three years and produce for an additional 22 years.

Planting. Planting starts in early spring by laying out the vineyard and marking vine sites. The drip line is laid on top of the ground and turned on to ease digging by hand, if the ground is dry. The potted plants are placed in the planting hole and covered with soil. The following year an average of 2% or 15 vines per acre will be replanted.

Trellis System. The trellis system is designed to support a bilateral cordon trained and spur pruned vineyard. The system in this study utilizes metal T posts at each vine with end posts at row ends to anchor the wires. Six permanent wires are secured to the end posts and attached to the metal T posts – one drip wire, one cordon wire, two middle wires, and two upper tees (wires). The owner and hired workers install the “modified vertical trellis” system. The system is considered part of the vineyard since it will be removed when the vines are removed. Therefore it is included in the establishment cost. The trellis system is installed during the first 2 years as follows:

First Year. In the fall of the first year or spring of the second (second year in this study), T posts and six end posts are installed. Eight-foot metal T posts are set at the first and last vine in each row and at every third vine down the row, six-foot T posts are set at first and second vine locations after the initial eight-foot post. End stakes are pounded into the soil at the row ends.

Second Year. Twenty-four inch cross arms are attached to the eight-foot posts and ten-inch cross arms to the six-foot posts. The wires are strung from end post to end post. Five 12 gauge, high tensile, cordon and catch (top) wires are attached to the cross arms. The bottom strand is 14 gauge, high tensile wire permanently attached to the end and T posts. The drip irrigation line is suspended from this bottom strand with drip clips.

Pruning/Training. Pruning in this study includes pruning, training, tying, suckering, shoot positioning, and thinning. All operations are not done each year, nor are all the operations used for other training methods or trellis systems. The prunings are placed in between the vine rows and chopped during the first discing.

First Year. The vines are winter pruned. During dormancy vines are pruned back to two bud spurs to provide shoots of which one is selected for trunk development.

Second Year. The vines are green tied, which includes suckering, tying, and vine training. Suckering is the removal of sprouts from the rootstock that compete with the main trunk and cordons for water and nutrients. Vines are trained by tying one shoot up the T post to become the main trunk. Later in the season this shoot is topped at or slightly below the cordon wire. Two lateral shoots are selected from the trunk as the bilateral cordons. Any remaining lower laterals are also pruned and the cordons cut back to the appropriate length as determined by girth. Green tying is done from May through July.

Third Year. Training vines continues by extending the cordons along the permanent cordon wire and selecting spur positions. Canes from spurs are pruned appropriately. Slower growing vines continue to be trained; however, year three is the last year that the vines are trained in this study. After vines are trained, canopy management including shoot positioning, thinning, and suckering trunks and cordons will also start. The number of hours per acre needed to prune declines from the previous year, but remains constant in the years thereafter. Vine trimming to reduce pruning costs begins in the fall of the third year.

Irrigation. Growers in the area have riparian rights and therefore do not have a water cost. Irrigation is the pumping cost. The local reclamation district charges a fee of \$30 per acre for drainage (see overhead). No assumption is made about effective rainfall. During the first two years, irrigations begin in May and end around September. In the third year additional irrigations are made postharvest. The amount of water applied to the vineyard period varies each year as shown in Table A.

Year	AcIn/Year		Total
	Preharvest	Postharvest	
1	6	0	6
2	6	0	6
3+	13	3	16

Pest Management. The pesticides and rates mentioned in this cost study as well as other materials available are listed in *UC Integrated Pest Management Guidelines, Grapes*. Pesticides mentioned in the study are commonly used, but are not recommendations.

Insects. Insect management begins in the third year. Mites can cause serious problems and are controlled with Omite. The material is applied in June with the grower's tractor and vineyard sprayer.

Diseases. Many pathogens attack grapevines, but the major disease assumed in this study is powdery mildew (*Uncinula necator*). Powdery mildew control begins the third year. Sulfur dust is applied five times and Rally, a sterol inhibitor, two times.

Weeds. The row centers are cultivated (disced) three to five times per season during the establishment years. The vine rows are strip sprayed with a residual herbicide such as Surflan in late fall or winter during the first two years. Summer weed control along the vine row begins in the second year with applications of Roundup, a foliar herbicide.

Vertebrate. Jackrabbits (*Lepus californicus*) are the major pest, although cottontail (*Sylvilagus audubonii*), and brush rabbit (*S. bachmani*) can also cause damage. Milk cartons placed around the young vines at planting protect the vines from rabbit damage. Another method is to build a fence around the vineyard.

Fertilization. Beginning in May of each of the first two years, 10-10-10 fertilizer is applied through the irrigation system at 5 pounds N, P and K per month for five months. This provides 25 pounds of each element per year. Beginning in the third year, UN-32 and potassium sulfate are applied through the drip system as in the production year.

Harvesting. Harvest begins in the third year and the crop is hand harvested. Hauling to the crusher is contracted and paid by the grower.

Yield. Typical annual yields for Chardonnay in the Sacramento River Delta (District 17) are shown in Table B.

Year:	3	4+
Tons Per	4.0	7.0

Production Operating Costs

(Tables 2 – 7)

Pruning. Pruning is done during the winter months. The prunings are placed in the vine centers and chopped during the first discing. Winter tying, where cordons are tied to the cordon wire with twine at the trunk and at each end of the cordons is done in March. Subsequently, trunk suckering is done in April, shoot removal in May, and leaf removal in June. Suckering is the removal of water sprouts from the trunk and below the soil surface. Shoot removal is the operation whereby the weak shoots, which lack vigor and do not originate from the fruiting spur buds, are removed. In some varieties such as Zinfandel, the clusters are thinned later (cluster thinning) in the season to reduce crop load or remove clusters that may be delayed in maturity or potential rot sites due to compactness. During leaf removal the basal leaves are removed in and around the fruit zone to allow for exposure and better air movement. Shoot positioning, thinning, and suckering trunks and cordons continue through the production years. Positioning and thinning shoots allows vines space to develop good fruit clusters, and opens the canopy to allow greater air movement through the vines and around the clusters. Pruning costs in this study are based on an hourly rate, although much of the pruning in the region is done by piecework. Mechanical vine trimming is done in June to open up the canopy and again post-harvest to reduce pruning costs.

Irrigation. Irrigation is the pumping cost and irrigation labor. Growers in the area have riparian rights and do not have a water cost. The local reclamation district charges a fee of \$30 per acre for drainage (see Overhead). No assumption is made about effective rainfall. Irrigation begins in May and ends with one irrigation after harvest.

Year	AcIn/Year		Total
	Preharvest	Postharvest	
1	6	0	6
2	6	0	6
3+	13	3	16

Fertilization. From May (leafout) through September, UN-32 is applied each month through the irrigation system. The amount of N applied is increased each month for a seasonal total of 40 pounds. Potassium Sulfate (K) is also applied through the system in four equal amounts from May through August at 50 pounds per application. Gypsum at 1,000 pounds per acre is custom spread in the fall after harvest.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Grapes*. **Pesticides mentioned in the study are not recommendations, but those commonly used in the region.** For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. For information and pesticide use permits, contact the local county agricultural commissioner's office.

Pest Control Advisor (PCA). Written recommendations are required for many pesticides and are made by licensed pest control advisors. In addition the PCA will monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCA's or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. The private PCA in this study monitors the field for agronomic problems, pest, and diseases. For an additional fee, the PCA installs irrigation monitoring equipment at 4 sites and does soil moisture modeling

Weeds. Herbicide choice is a function of weed pressure which can change over time. In this vineyard, vine row weeds are controlled with a tank mix of Goal and Surflan applied as a strip spray during January. Resident vegetation in the row centers is managed with four discings per season. Roundup, a foliar herbicide, is applied 3 times over the spring and summer in the vine row.

Insects. Leafhoppers and mites are important pests, but will usually not occur in the same year. In this study, mites are controlled in March (see Diseases below) and in June with Omite.

Diseases. Micronized sulfur (Thiolux) and copper spray (Champ) are applied in March at budbreak for powdery mildew and mite control. Powdery mildew treatments continue in April on an 8 to 10 day schedule, then beginning in late May a 14 to 21 day schedule. Four applications of a sterol inhibitor (Rally) or strobilurin (Flint) are interspersed with the ten dusting sulfur applications (e.g. 2 dustings, 1 Rally or Flint).

Harvest. Chardonnay harvest begins in early September, whereas Merlot harvest begins at the end of September. The crop is machine harvested by a custom operator. Hauling to the crusher is contracted and the grower pays \$15 per load for local hauls. Additional charges will apply for hauls considered being out of the local area.

Yields. Yield maturity is reached in the fourth year. An assumed yield of 7 tons per acre is used to calculate returns in the production years. Typical yield range for Chardonnay in the Sacramento River Delta is 6.5 to 7.5 tons per acre. Annual yields are measured in tons as shown in Table B.

Returns. Return prices per ton for wine grapes are determined by variety and percent sugar (Brix). The effect of sugar percentages on prices (low and high) is shown in Table C for District 17 growers. The lowest price in the last four years is \$125 per ton while the high is \$1,300; the average weighted price for Chardonnay is \$609 per ton. Use of return prices for grapes is for calculating net returns to growers at different yields and price as shown in Table 7. A return of \$590 per ton based on 2001 prices for Chardonnay wine grapes is used in this study.

Year	\$/Ton Base Price		Weighted Average
	Low	High	
1998	500	1,300	776
1999	600	1,150	704
2000	125	1,200	362
2001	150	1,000	592
Average	344	1,163	609

Final Grape Crush Report 1998 - 2001

Assessments. The Clarksburg Wine Grape Growers Association has a voluntary \$6 per acre assessment for all growers and wineries. The program supports advertisement and promotion of district wines. Grower participation is rated at 90%, and included as a cost in this study. California Department of Food and Ag assesses growers \$0.003 on the gross value (yields x returns) for the Glassy Winged Sharpshooter Insect program.

Pickup/ATV. The grower uses the pickup for business and personal use. The assumed business use is 12,000 miles per year for the ranch. The All Terrain Vehicle (ATV) is used on the ranch for checking the vineyard, irrigating, and some spraying.

Labor. Hourly wages for workers are \$10.50 for machine operators and \$6.75 per hour non-machine labor. Adding 34% for the employers share of federal and state payroll taxes, insurance, and other possible benefits gives the labor rates shown of \$14.07 and \$9.05 per hour for machine labor and non-machine labor, respectively. Labor for operations involving machinery are 20% higher than the operation time given in Table 2 to account for the extra labor involved in equipment set up, moving, maintenance, work breaks, and field repair.

Equipment Operating Costs. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by ASAE. Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO horsepower, and fuel type. Prices for on-farm delivery of diesel and gasoline are \$1.26 and \$1.51 per gallon, respectively. The fuel, lube, and repair cost per acre for each operation in Table 2 is determined by multiplying the total hourly operating cost in Table 6 for each piece of equipment used for the selected operation by the hours per acre. Tractor time is 10% higher than implement time for a given operation to account for setup, travel and down time.

Interest On Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 7.40% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge.

Risk. The risks associated with crop production should not be minimized. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks, which affect profitability and economic viability.

Cash Overhead Costs (Tables 1-7)

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, sanitation services, equipment repairs, and management.

Property Taxes. Counties charge a base property tax rate of 1% on the assessed value of the property. In some counties special assessment districts exist and charge additional taxes on property including equipment, buildings, and improvements. For this study, county taxes are calculated as 1% of the average value of the property. Average value equals new cost plus salvage value divided by 2 on a per acre basis.

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.660% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$698 for the entire farm.

Office Expense. Office and business expenses are estimated at \$100 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges.

Reclamation Fee. See Drainage System.

Sanitation Services. Sanitation services provide two portable toilets for the vineyard and cost the farm \$3,420 annually. The cost includes two double toilets units with wash basins, delivery and 9 months of weekly service.

Crop Insurance. The insurance protects the farmer from crop loss at levels purchased by the grower. In this study, the insurance is based on a 70 – 75% level and is an average of fees paid by participating growers.

Management/Supervisor Wages. A salary is included to indicate that a cash cost for professional supervision of the vineyard is incurred. An expense of \$67,000 per year includes 34% for payroll overhead and insurance benefits.

Investment Repairs. Annual maintenance is calculated as 2 percent of the purchase price.

Non-Cash Overhead Costs

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments.

Capital Recovery Costs. Capital recovery cost is the annual depreciation and interest costs for a capital investment. It is the amount of money required each year to recover the difference between the purchase price and salvage value (unrecovered capital). It is equivalent to the annual payment on a loan for the investment with the down payment equal to the discounted salvage value. This is a more complex method of calculating ownership costs than straight-line depreciation and opportunity costs, but more accurately represents the annual costs of ownership because it takes the time value of money into account (Boehlje and Eidman). The formula for the calculation of the annual capital recovery costs is $((\text{Purchase Price} - \text{Salvage Value}) \times \text{Capital Recovery Factor}) + (\text{Salvage Value} \times \text{Interest Rate})$.

Salvage Value. Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 5.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

Interest Rate. The interest rate of 6.41% used to calculate capital recovery cost is the USDA-ERS's ten-year average of California's agricultural sector long-run rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Establishment Cost. Costs to establish the vineyard are used to determine capital recovery expenses, depreciation, and interest on investment for the production years. Establishment cost is the sum of the costs for land preparation, trellis system, planting, vines, cash overhead and production expenses for growing the vines through the first year that grapes are harvested minus any returns from production. The Total Accumulated Net Cash Cost on Table 1, in the third year represents the establishment cost. For this study the cost is \$7,804 per acre or \$468,240 for the 60-acre vineyard. The establishment cost is spread over the remaining 22 years of the 25 years the vineyard is in production.

Irrigation System. The previous vineyard is assumed to have a irrigation system that has been refurbished. A new pump, motor, and filtration/injector station is being installed along with the drip irrigation system during planting. The 2-15 hp ditch pumps, filtration station, fertilizer injector system, drip lines and the labor to install the components are included in the irrigation system cost. Water is pumped from a 25-foot depth. The irrigation system is considered an improvement to the property and has a 25-year life.

Drainage System. Tile drains are installed underground in the fields prior to planting. In addition, a reclamation district manages the main drainage canals and charges a \$30 per acre fee.

Land. Bare land is valued at \$5,000 per acre or \$5,128 per net plantable (195) acre.

Building. The shop building is a 40'X 60' metal building on a cement slab.

Tools. This includes shop tools, hand tools, and miscellaneous field tools such as pruning tools.

Fuel Tanks. Two 500-gallon fuel tanks using gravity feed are on metal stands. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. Annual ownership costs for equipment and other investments are shown in Tables 3 and 8. Equipment costs are composed of three parts: non-cash overhead, cash overhead, and operating costs. Both of the overhead factors have been discussed in previous sections. The operating costs consist of repairs, fuel, and lubrication and are discussed under operating costs.

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

REFERENCES

- American Society of Farm Managers and Rural Appraisers. 2001. *Trends in Agricultural Land & Lease Values*. California Chapter of the American Society of Farm Managers and Rural Appraisers. Woodbridge, CA.
- American Society of Agricultural Engineers. 1994. *American Society of Agricultural Engineers Standards Yearbook*. Russell H. Hahn and Evelyn E. Rosentreter (ed.) St. Joseph, MO. 41st edition.
- Boelje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, NY.
- California State Department of Food and Agriculture. 1998-2001. Final Grape Crush Report. California Department of Food and Agriculture. Sacramento, CA.
- Statewide IPM Project. 2000. "UC Pest Management Guidelines, Grapes". In M. L. Flint (ed.) *UC IPM Pest Management Guidelines*. Pub. 3339. IPM Education and Publication. University of California, Division of Agriculture and Natural Resources. Oakland, CA.
- United States Department of Agriculture-Economic Reporting Service. *Farm Financial Ratios Indicating Solvency and Profitability 1960 – 99, California*. 2001.
www.ers.usda.gov/data/farbalancesheet/fbsdmu.htm. Internet; accessed January 4, 2002.
- Verdegaal, Paul S., Karen M. Klonsky. Richard L. De Moura, *Sample Costs to Establish a Vineyard and Produce Wine Grapes*. 2001. University of California Cooperative Extension. Department of Agricultural and Resource Economics. Davis, CA.
- Weaver, Robert J. 1976. *Grape Growing*. John Wiley and Sons. New York, NY.

For information concerning the above or other University of California publications, contact UC DANR Communications Services at 1-800-994-8849, online at www.ucop.edu, or your local county UC Cooperative Extension office.

UC COOPERATIVE EXTENSION
Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A VINEYARD
 SACRAMENTO VALLEY - Sacramento River Delta 2002

	Cost Per Acre			
	Year:	1st	2nd	3rd
Tons Per Acre:				4.00
Planting Costs:				
Vineyard Removal		350		
Land Preparation - Rip/Subsoil 2X		150		
Land Preparation - Disc 2X		50		
Land Preparation - Laser Level 1X		150		
Land Preparation - Cultivate 1X (Disc + Cultipacker)		25		
Mark , Layout, Stake Vineyard		87		
Dig Hole, Plant, Wrap Vines		254	21	
Vines:726 Per Acre (2% Replant In 2nd Year)		1,924	40	
TOTAL PLANTING COSTS		2,990	61	
Trellis System Costs:				
Install T Posts & End Posts			1,225	
Spool, Stretch & Tie Wires			323	
Install Cross Arms			359	
Hang Drip Line on Bottom Wire			40	
TOTAL TRELLIS SYSTEM COSTS			1,947	
Cultural Costs:				
Prune			104	150
Irrigate -Fertilize NPK (Yr 1-2) NK (Yr 3)	89	89	89	119
Green Tie (Sucker, Tie & Train)			636	330
Weed Control - Winter Strip Spray	38	38	38	75
Weed Control - Hand Weed	120	120		
Weed Control - Disc (3X 1st Year, 5X Year 2+)	31	52		52
Weed Control - Spot Spray (25% Of Acreage)		30		30
Insect Control - Mites				48
Shoot Positioning/Thin				149
Disease Control - Mildew - 7X				73
Pickup Truck Use	19	19		47
ATV Use	16	16		14
TOTAL CULTURAL COSTS	313	1,104		1,087
Harvest Costs:				
Pick Fruit				480
Haul To Crusher				60
TOTAL HARVEST COSTS				540
Postharvest Costs:				
Irrigate-Fertilize NK				17
Trim Vines				10
TOTAL POSTHARVEST COSTS				27
Assessments:				
Clarksburg Wine Growers Association & Sharpshooter				13
TOTAL ASSESSMENT COSTS				13
Interest On Operating Capital @ 7.40%		117	104	38
TOTAL OPERATING COSTS/ACRE		3,420	3,216	1,705

U.C. COOPERATIVE EXTENSION
Table 1. continued

Year	Cost Per Acre		
	1st	2nd	3rd
Tons Per Acre			4.00
Cash Overhead Costs:			
Office Expense	100	100	100
Liability Insurance	4	4	4
Sanitation Fees	18	18	18
Managers Salary	344	344	344
Reclamation Fee	30	30	30
Property Taxes	14	15	16
Property Insurance	43	44	44
Investment Repairs	53	53	53
TOTAL CASH OVERHEAD COSTS	606	608	609
TOTAL CASH COSTS/ACRE	4,026	3,824	2,314
INCOME/ACRE FROM PRODUCTION			2,360
NET CASH COSTS/ACRE FOR THE YEAR	4,026	3,824	
PROFIT/ACRE ABOVE CASH COSTS			46
ACCUMULATED NET CASH COSTS/ACRE	4,026	7,850	7,804
Capital Recovery			
Shop Building	28	28	28
Fuel Tanks	1	1	1
Shop Tools	6	6	6
Drip Irrigation System	101	101	101
Drainage System	81	81	81
Land	329	329	329
Equipment	24	29	51
TOTAL INTEREST ON INVESTMENT	570	575	597
TOTAL COST/ACRE FOR THE YEAR	4,596	4,399	2,911
INCOME/ACRE FROM PRODUCTION			2,360
TOTAL NET COST/ACRE FOR THE YEAR	4,596	4,399	551
NET PROFIT/ACRE ABOVE TOTAL COST			
TOTAL ACCUMULATED NET COST/ACRE	4,596	8,995	9,546

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE to PRODUCE WINE GRAPES
 SACRAMENTO VALLEY - Sacramento River Delta 2002

Operation	Operation	Cash and Labor Cost per acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent			
Cultural:								
Prune	30.00	272	0	0	0	272		
Prune - Winter Tie	8.83	80	0	0	0	80		
Prune-Shoot Removal/Positioning	16.50	149	0	0	0	149		
Prune-Trunk Suckering	5.50	50	0	0	0	50		
Prune - Green Tie(Sucker Tie Train)2X	8.00	72	0	0	0	72		
Prune - Leaf Removal	16.50	149	0	0	0	149		
Prune -Trim Vines	0.34	6	4	0	0	10		
Weed - Disc 4X	1.58	27	15	0	0	42		
Weed - Winter Strip	0.47	8	2	65	0	75		
Weed - Spray Vine Rows 3X	1.41	48	3	41	0	92		
Disease - Mildew/Mites	0.20	3	2	10	0	15		
Disease - Mildew Dust 10X	1.47	25	12	24	0	61		
Disease - Mildew Spray 4X	0.98	17	10	90	0	117		
Insect - Mites	0.29	5	3	42	0	50		
Irrigate	5.50	50	0	28	0	78		
Fertilize N w/irrigation 5X	0.00	0	0	7	0	7		
Fertilize K w/irrigation 4X	0.00	0	0	29	0	29		
PCA/Irrigation Monitoring Fees	0.00	0	0	0	47	47		
Pickup Truck Use	2.05	35	12	0	0	47		
ATV Use	0.86	15	1	0	0	16		
TOTAL CULTURAL COSTS	100.49	1,010	64	337	47	1,458		
Harvest:								
Machine Harvest Fruit	0.00	0	0	0	260	260		
Haul To Crusher	0.00	0	0	0	105	105		
TOTAL HARVEST COSTS	0.00	0	0	0	365	365		
Postharvest:								
Prune -Trim Vines	0.34	6	4	0	0	10		
Irrigate	1.10	10	0	7	0	16		
Fertilize N w/irrigation 5X	0.00	0	0	3	0	3		
Fertilize - Gypsum	0.00	0	0	24	0	24		
TOTAL POSTHARVEST COSTS	1.44	16	4	33	0	53		
Assessment:								
Crop Assessments	0.00	0	0	18	0	18		
TOTAL ASSESSMENT COSTS	0.00	0	0	18	0	18		
Interest on operating capital @ 7.40%						53		
TOTAL OPERATING COSTS/ACRE		1,025	68	389	412	1,947		
Cash Overhead:								
Office Expense						100		
Liability Insurance						4		
Sanitation Fees						18		
Manager Salary						344		
Crop Insurance						100		
Reclamation Fee						30		
Property Taxes						55		
Property Insurance						70		
Investment Repairs						53		
TOTAL CASH OVERHEAD COSTS						773		
TOTAL CASH COSTS/ACRE						2,720		

UC COOPERATIVE EXTENSION
Table 2. continued

Operation	Operation	Cash and Labor Cost per acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent			
Non-cash Overhead:		Per producing Acre		-- Annual Cost -- Capital Recovery				
Building 40'X60'		308		28		28		
Fuel Tanks 2-500 gal		18		1		1		
Tools-Shop/Field		62		6		6		
Drip Irrigation System		1,247		101		101		
Land		5,128		329		329		
Drainage System		1,000		81		81		
Vineyard Establishment		7,804		671		671		
Equipment		506		62		62		
TOTAL NON-CASH OVERHEAD COSTS		16,072		1,281		1,281		
TOTAL COSTS/ACRE						4,001		

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS PER ACRE to PRODUCE WINE GRAPES
 SACRAMENTO VALLEY - Sacramento River Delta 2002

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Wine Grape - Chardonnay	7.00	ton	590.00	4,130	
OPERATING COSTS					
Fungicide:					
Champ 2 Flowable	2.00	pint	4.00	8	
Thiolux Micronized Sulfur	8.00	lb	0.25	2	
Dusting Sulfur	150.00	lb	0.16	24	
Rally 40W	8.00	oz	4.75	38	
Flint	4.00	oz	12.99	52	
Insecticide:					
Omite 30W	7.00	lb	6.06	42	
Herbicide:					
Roundup Ultra	6.00	pint	6.83	41	
Goal 2XL	2.00	pint	13.32	27	
Surflan 4 AS	3.20	pint	11.98	38	
Fertilizer:					
UN 32	40.00	lb N	0.26	11	
Potassium Sulfate	200.00	lb	0.15	29	
Gypsum Haul Spread	0.50	ton	47.50	24	
Vine Aids:					
Tying Materials	1.00	acre	0.00	0	
Water:					
Pumping Cost	16.00	acin	2.18	35	
Contract:					
Machine Harvest	1.00	acre	260.00	260	
Haul to Crusher	7.00	ton	15.00	105	
PCA Field Monitoring Fee	1.00	acre	35.00	35	
PCA Irrigation Monitoring Fee	1.00	acre	12.00	12	
Assessment:					
Clarksburg Wine Grape Growers	1.00	acre	6.00	6	
Sharpshooter Program CDFA	4,130.00	ton	0.00	12	
Labor (machine)	12.00	hrs	14.07	169	
Labor (non-machine)	94.63	hrs	9.05	856	
Fuel - Gas	5.71	gal	1.51	9	
Fuel - Diesel	22.73	gal	1.26	29	
Lube				5	
Machinery repair				26	
Interest on operating capital @ 7.40%				53	
TOTAL OPERATING COSTS/ACRE				1,947	
NET RETURNS ABOVE OPERATING COSTS				2,183	
CASH OVERHEAD COSTS:					
Office Expense				100	
Liability Insurance				4	
Sanitation Fees				18	
Manager Salary				344	
Crop Insurance				100	
Reclamation Fee				30	
Property Taxes				55	
Property Insurance				70	
Investment Repairs				53	
TOTAL CASH OVERHEAD COSTS/ACRE				773	
TOTAL CASH COSTS/ACRE				2,720	

UC COOPERATIVE EXTENSION
Table 3. continued

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Building 40'X60'				28	
Fuel Tanks 2-500 gallon				1	
Tools-Shop/Field				6	
Drip Irrigation System				101	
Land				329	
Drainage System				81	
Vineyard Establishment				671	
Equipment				62	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,281	
TOTAL COSTS/ACRE				4,001	
NET RETURNS ABOVE TOTAL COSTS				129	

UC COOPERATIVE EXTENSION
Table 4. MONTHLY CASH COSTS to PRODUCE WINE GRAPES
 SACRAMENTO VALLEY - Sacramento River Delta 2002

Beginning JAN 02 Ending DEC 02	JAN 02	FEB 02	MAR 02	APR 02	MAY 02	JUN 02	JUL 02	AUG 02	SEP 02	OCT 02	NOV 02	DEC 02	TOTAL
Cultural:													
Prune	272												272
Weed - Disc 4X			10	10	10	10							42
Prune-Winter Tie			80										80
Disease - Mildew/Mites			15										15
Disease-Mildew Dust 10X				12	12	12	12	12					61
Disease-Mildew Spray 4X				30	31	24	31						117
Prune-Shoot Removal/Positioning					149								149
Prune-Trunk Suckering				50									50
Irrigate					31	15	16	16					78
Fertilize N w/irrigation					1	2	2	3					7
Weed - Spray Vine Row					31	31	31						92
Fertilize K w/irrigation					7	7	7	7					29
Prune-Green Tie					36	36							72
Prune-Leaf Removal						149							149
Prune-Trim Vines						10							10
Pest - Mites						50							50
Weed - Winter Strip	75												75
PCA/Irrigation Monitoring	5	5	5	5	5	5	5	5	5	5			47
Pickup Truck Use	4	4	4	4	4	4	4	4	4	4	4	4	47
ATV Use	2	2	2	2	2	2	2	2	2	2	2		16
TOTAL CULTURAL COSTS	356	10	116	112	320	358	110	48	10	10	4	4	1,458
Harvest:													
Machine Harvest Fruit									260				260
Haul To Crusher									105				105
TOTAL HARVEST COSTS									365				365
Postharvest:													
Prune-Trim Vines									10				10
Irrigate										16			16
Fertilize N w/irrigation										3			3
Fertilize - Gypsum										24			24
TOTAL POSTHARVEST COSTS									10	43			53
Assessment:													
Assessments-Local & State									18				18
TOTAL ASSESSMENT COSTS									18				18
Interest on operating capital	2	2	3	4	6	8	9	9	11	0	0	0	53
TOTAL OPERATING COSTS/ACRE	358	12	119	116	325	365	118	57	415	53	4	4	1,947
OVERHEAD:													
Office Expense	8	8	8	8	8	8	8	8	8	8	8	8	100
Liability Insurance		4											4
Sanitation Fees	1	1	1	1	1	1	1	1	1	1	1	1	18
Manager Salary	29	29	29	29	29	29	29	29	29	29	29	29	344
Crop Insurance		100											100
Reclamation Fee	3	3	3	3	3	3	3	3	3	3			30
Property Taxes	55												55
Property Insurance	35						35						70
Investment Repairs	4	4	4	4	4	4	4	4	4	4	4	4	53
TOTAL CASH OVERHEAD COSTS	136	149	46	46	46	46	81	46	46	46	43	43	773
TOTAL CASH COSTS/ACRE	494	162	165	162	371	411	199	103	460	99	47	47	2,720

UC COOPERATIVE EXTENSION
**Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
and BUSINESS OVERHEAD**
SACRAMENTO VALLEY - Sacramento River Delta 2002

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
						Insur- ance	Taxes		
02	80 HP 4WD Tractor	55,000	15	10,708	5,370	217	329		5,915
02	70 HP 4WD Tractor	45,000	15	8,761	4,393	177	269		4,840
02	ATV 4WD	4,500	5	2,017	725	22	33		779
02	Disc - Tandem 7'	5,500	8	1,242	776	22	34		832
02	Duster - 3 Pt	5,000	5	1,629	914	22	33		969
02	Orch/VineSpray500G	20,378	5	6,638	3,724	89	135		3,948
02	Pickup Truck 1/2 T	23,000	7	8,725	3,154	105	159		3,417
02	Vine Trimmer -	8,500	10	228	1,160	29	44		1,233
02	Weed Sprayer 200 G	4,000	5	1,303	731	18	27		775
TOTAL		170,878		41,251	20,948	700	1,061		22,708
60% of New Cost *		102,527		24,751	12,569	420	636		13,625

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Building 40'X60'	60,000	20		5,407	198	300	1,200	7,105
Drainage System	195,000	25		15,853	644	975	3,900	21,372
Drip Irrigation System	243,150	25		19,768	802	1,216	4,863	26,649
Fuel Tanks 2-500 gallon	3,500	25	1,295	262	16	24	70	372
Land	1,000,000	25	1,000,000	64,100	6,600	0	0	70,700
Tools-Shop/Field	12,000	15	1,133	1,222	43	66	240	1,571
Vineyard Establishment	468,240	22		40,283	1,545	2,341	0	44,169
TOTAL INVESTMENT	1,981,890		1,002,428	146,895	9,848	4,922	10,273	171,938

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Crop Insurance	195	acre	100.00	19,500
Liability Insurance	195	acre	3.57	696
Manager Salary	195	acre	343.59	67,000
Office Expense	195	acre	100.00	19,500
Reclamation Fee	195	acre	30.00	5,850
Sanitation Fees	195	acre	17.53	3,418

UC COOPERATIVE EXTENSION
Table 6. HOURLY EQUIPMENT COSTS
 SACRAMENTO VALLEY - Sacramento River Delta 2002

		COSTS PER HOUR							
Yr	Description	Actual Hours Used	Cash Overhead			Operating			Total Costs/Hr.
			Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
02	80 HP 4WD Tractor	252.60	12.75	0.52	0.78	1.34	5.69	7.03	21.08
02	70 HP 4WD Tractor	863.80	3.05	0.12	0.19	1.92	4.98	6.90	10.26
02	ATV 4WD	535.90	0.81	0.02	0.04	0.34	1.16	1.50	2.37
02	Disc - Tandem 7'	309.00	1.51	0.04	0.07	1.85	0.00	1.85	3.46
02	Duster - 3 Pt	286.20	1.92	0.05	0.07	0.73	0.00	0.73	2.76
02	Orch/Vine Sprayer 500 gal	284.70	7.85	0.19	0.28	2.95	0.00	2.92	11.27
02	Pickup Truck 1/2 Ton	400.00	4.76	0.16	0.24	1.69	4.34	6.03	11.15
02	Vine Trimmer	134.30	5.19	0.13	0.19	3.50	0.00	3.50	9.01
02	Weed Sprayer 200 gal	367.00	1.19	0.03	0.04	0.58	0.00	0.58	1.85

UC COOPERATIVE EXTENSION
Table 7. RANGING ANALYSIS
 SACRAMENTO VALLEY - Sacramento River Delta 2002

COSTS PER ACRE AT VARYING YIELD TO PRODUCE WINE GRAPES

	YIELD in Tons/Acre						
	5.50	6.00	6.50	7.00	7.50	8.00	8.50
OPERATING COSTS:							
Cultural Cost	1,458	1,458	1,458	1,458	1,458	1,458	1,458
Harvest Cost	342	350	358	365	372	380	388
Assessment Cost	16	17	17	18	20	20	21
Postharvest Cost	53	53	53	53	53	53	53
Interest on operating capital	53	53	53	53	53	53	53
TOTAL OPERATING COSTS/ACRE	1,922	1,930	1,938	1,947	1,955	1,964	1,972
Total Operating Costs/ton	349	322	298	278	261	245	232
CASH OVERHEAD COSTS/ACRE							
TOTAL CASH COSTS/ACRE	2,695	2,703	2,712	2,720	2,728	2,737	2,745
Total Cash Costs/ton	490	451	417	389	364	342	323
NON-CASH OVERHEAD COSTS/ACRE							
TOTAL COSTS/ACRE	3,975	3,984	3,992	4,001	4,009	4,017	4,026
Total Costs/ton	723	664	614	572	535	502	474

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/ton	YIELD (ton/acre)						
	5.50	6.00	6.50	7.00	7.50	8.00	8.50
440.00	498	710	922	1,133	1,345	1,556	1,768
490.00	773	1,010	1,247	1,483	1,720	1,956	2,193
540.00	1,048	1,310	1,572	1,833	2,095	2,356	2,618
590.00	1,323	1,610	1,897	2,183	2,470	2,756	3,043
640.00	1,598	1,910	2,222	2,533	2,845	3,156	3,468
690.00	1,873	2,210	2,547	2,883	3,220	3,556	3,893
740.00	2,148	2,510	2,872	3,233	3,595	3,956	4,318

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE \$/ton	YIELD (ton/acre)						
	5.50	6.00	6.50	7.00	7.50	8.00	8.50
440.00	-275	-63	148	360	572	783	995
490.00	0	237	473	710	947	1,183	1,420
540.00	275	537	798	1,060	1,322	1,583	1,845
590.00	550	837	1,123	1,410	1,697	1,983	2,270
640.00	825	1,137	1,448	1,760	2,072	2,383	2,695
690.00	1,100	1,437	1,773	2,110	2,447	2,783	3,120
740.00	1,375	1,737	2,098	2,460	2,822	3,183	3,545

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE \$/ton	YIELD (ton/acre)						
	5.50	6.00	6.50	7.00	7.50	8.00	8.50
440.00	-1,555	-1,344	-1,132	-921	-709	-497	-286
490.00	-1,280	-1,044	-807	-571	-334	-97	139
540.00	-1,005	-744	-482	-221	41	303	564
590.00	-730	-444	-157	129	416	703	989
640.00	-455	-144	168	479	791	1,103	1,414
690.00	-180	156	493	829	1,166	1,503	1,839
740.00	95	456	818	1,179	1,541	1,903	2,264