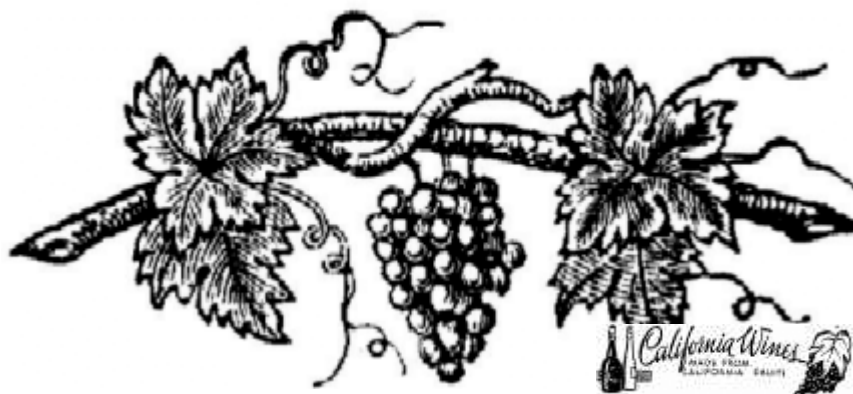

UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2008

SAMPLE COSTS
TO ESTABLISH A VINEYARD AND PRODUCE
WINEGRAPES

Chardonnay Variety



Sacramento Valley
SACRAMENTO RIVER DELTA
Sacramento and Yolo Counties – Crush District 17

Chuck A. Ingels
Karen M. Klonsky

UC Cooperative Extension Farm Advisor, Sacramento County
UC Cooperative Extension Specialist, Department of Agricultural and Resource
Economics, UC Davis

Richard L. De Moura

Staff Research Associate, Department of Agricultural and Resource Economics,
UC Davis

Cooperators:

Richard Samra, Thom Wiseman, Mark Scribner, Ken Wilson, Joe Salman

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Chardonnay

Sacramento Valley, Sacramento River Delta of
Sacramento and Yolo Counties – 2008

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INTRODUCTION

Sample costs to establish a vineyard and produce winegrapes 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 are available for many commodities. Current and archived studies can be downloaded from the Agricultural and Resource Economics website at UC Davis <http://coststudies.ucdavis.edu>. These studies as well as other archived studies not on the website can be requested through the department by calling (530) 752-1517.

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ASSUMPTIONS

The assumptions refer to Tables 1 to 8 and pertain to sample costs to establish a vineyard and produce winegrapes in the Sacramento River Delta of the Sacramento Valley – Sacramento and Yolo counties (California Crush District 17). The cultural practices described represent production operations and materials considered typical on a well-managed vineyard in the region. Costs, materials, and practices in this study will not apply to all farms. Timing of and types of cultural practices will vary among growers within the region and from season to season due to variables such as weather, soil, and insect and disease pressure. The study does not represent a single farm and is intended as a guide only. **The use of trade names and cultural practices in this report does not constitute an endorsement or recommendation by the University of California nor is any criticism implied by omission of other similar products or cultural practices.**

Farm. The hypothetical farm located on the valley floor in the Sacramento River Delta of Sacramento and Yolo Counties is 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. **Operations are based on a calendar year.**

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. Afterwards, 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 6 x 10 foot 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 the 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 17 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. If the ground is dry, water may be applied to ease digging by hand. 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 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 with ten-inch cross arms attached below the larger crossarms. 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.

Training/Pruning. Training and pruning establish the vine framework and these techniques will vary with variety and trellis system. Training during the establishment years includes pruning, 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 allowed to grow freely with no attempt at training.

Second Year. During dormancy (February), vines are pruned back to two bud spurs to provide shoots of which one will be selected for trunk development. The vines are green tied in May, June and July, 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 water costs. Irrigation is the pumping and labor costs. 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 varies each year as shown in Table A.

Table A. Applied Irrigation Water

Year	AcIn/Year		
	Preharvest	Postharvest	Total
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 other materials may be available.

Insects. Insect management begins in the third year. Mites can cause serious problems and are controlled with Acramite. 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 Prowl in late fall or winter during the first two years and with Direx in the third year. 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, 8-8-8 fertilizer is applied through the irrigation system at 5 pounds nitrogen (N), phosphorous (P) and potassium (K) per month for five months. This provides 25 pounds of each element per year using 312.50 pounds of material. 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.

Annual Yields		
Year:	3	4+
Tons Per Acre:	4.0	7.0

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

Production Operating Costs (Tables 2 – 8)

Canopy Management/Pruning. Pruning is done during the winter months (January). The prunings are placed in the vine centers and chopped in March 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 (September/October) to reduce pruning costs.

Irrigation. Irrigation is the pumping cost and irrigation labor. Growers in the area have riparian rights and do not have water costs. 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 (October).

Fertilization/Soil Amendments. From May (leafout) through September and post harvest in October, UN-32 is applied each month through the irrigation system. The amount of N applied is increased each month from May 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 Adviser (PCA). Written recommendations are required for many pesticides and are made by licensed pest control advisers. In addition the PCA will monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCAs 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 Direx 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 with the disease spray (see below) and in June with Acramite.

Diseases. Micronized sulfur (Thiolux) and copper spray (Champ) are applied in March at budbreak for powdery mildew, phomopsis, and mite control. Powdery mildew treatments continue in April on an 8 to 10 day schedule, then beginning in late May on a 14 to 21 day schedule with the last application being in August. Rotation of different fungicides is necessary to prevent disease resistance. Four applications of a sterol inhibitor (Rally in April and June) or strobilurin (Flint in May and July) are interspersed with the ten dusting sulfur applications.

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 \$18 per load for local hauls (within 20 miles of field) which includes a fuel surcharge. Additional charges will apply for hauls considered being out of the local area.

Yields. Yield maturity is reached in the fourth year. An assumed average yield of 7 tons per acre over the remaining life of the vineyard 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.

Returns. Return prices per ton for winegrapes 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 five years is \$65 per ton while the high is \$1,100; the average weighted price for Chardonnay is \$529 per ton. Use of return prices for grapes is for calculating net returns to growers at different yields and prices as shown in Table 5. A return of \$550 per ton based on 2006 District 17 prices for Chardonnay winegrapes is used in this study.

Assessments. The Clarksburg Wine Growers & Vintners Association is a voluntary association with dues of \$3 per acre for growers and wineries not affected by the minimum and maximum dues. Grower participation is rated at 90%, and is included as a cost in this study. The program supports advertisement and promotion of district wines. California Department of Food and Ag assesses growers \$0.002 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 weed spraying and is included in that cost.

Table C. Annual Returns for Chardonnay, District 17

Year	\$/Ton Base Price*		Weighted Average
	Low	High	
2002	65	1,000	530
2003	90	1,000	514
2004	300	1,000	519
2005	200	1,100	531
2006	300	1,000	553
Average	191	1,020	529

*Final Grape Crush Report 2002-2006

Labor, Equipment, Interest and Risk

Labor. Hourly wages for workers are \$11.50 for machine operators and \$8.00 per hour non-machine labor. Adding 33% for the employer's share of federal and state payroll taxes, insurance, and other possible benefits gives the labor rates shown of \$15.30 and \$10.64 per hour for machine labor and non-machine labor, respectively. Workers' compensation costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2007 (personal email from California Department of Insurance, May 18, 2007, unreferenced). 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 American Society of Agricultural Engineers (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 red dye diesel and gasoline are \$2.50 and \$3.10 per gallon, respectively. The cost includes a 2% local sales tax on diesel fuel, but does not include excise taxes. Gasoline costs include an 8% sales tax plus federal and state excise tax. Some federal and excise tax can be refunded for on-farm use when filing your income tax. The costs are based on 2007 American Automobile Association (AAA) and Department of Energy (DOE) monthly data. 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 7 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 8.75% 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. The interest rate is the basic rate provided by a farm lending agency as of January, 2008.

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

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.

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 two on a per acre basis.

Insurance. Insurance for farm investments varies depending on the assets included and the amount of coverage. For this study, property insurance provides coverage for property loss and is charged at 0.740% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$774 for the entire farm.

Office Expense. Office and business expenses are not based on collected data, but are estimated at \$150 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 \$3,700 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. Costs are \$90 per acre at the 70% level.

Management/Supervisor Wages. A salary is included to indicate that a cash cost for professional supervision of the vineyard is incurred. An expense of \$90,000 per year includes 33% for payroll overhead and insurance benefits (\$67,669 basic wage).

Investment Repairs. Annual maintenance is calculated as 2% of the purchase price, except for vineyard maintenance (see Vineyard Establishment).

Non-Cash Overhead Costs (Investments)

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 6.

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 6.25% used to calculate capital recovery cost is the effective long term interest rate as of January 2008. The interest rate is provided by a local farm lending agency and will vary according to risk and amount of loan.

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 \$13,402 per acre or \$804,100 for the 60-acre vineyard. The establishment cost is spread over the remaining 17 years of the 20 years the vineyard is in production. Annual vineyard maintenance (trellis and vine repair) is assumed to be 0.10% of the establishment cost or approximately \$15 per acre per year and is included in investment repairs in the tables.

Irrigation System. The previous vineyard is assumed to have an 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 20-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 available for vineyards based on grower input is valued at \$8,000 per acre or \$8,205 per net plantable (195) acre.

Building. The metal buildings are on a cement slab and comprise 2,400 square feet.

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 Table 6. 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.

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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.

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Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A VINEYARD
SACRAMENTO VALLEY - Sacramento River Delta (Sacramento & Yolo Counties) 2008

	Cost Per Acre			
	Year:	1st	2nd	3rd
Tons Per Acre:				4
Planting Costs:				
Land Prep: Vineyard Removal		450		
Land Prep: Rip 2X (custom)		200		
Land Prep: Disc 2X (custom)		70		
Land Prep: Disk + Cultipacker (custom)		35		
Land Prep: Laser Level (custom)		200		
Plant: Mark, Layout vineyard		102		
Plant: Dig holes, plant, place carton over vines		343	25	
Vines: 726 per acre (replant in 2d year)		1,924	40	
Trellis: Materials plus labor (grower installed)			4,247	
TOTAL PLANTING COSTS		3,324	4,312	
Cultural Costs:				
Irrigate: pumping, labor.		74	74	113
Fertilize: through drip (Yrs 1-2, 8-8-8. Yr 3 ,UN32 + Potassium Sulfate)		538	538	111
Weed: Disk Middles (Yr 1, 3X. Yr 2+, 5X)		39	65	65
Weed: Hand (vine row)		141	141	
Weed: Winter Strip Spray (Yrs 1-2, Prowl. Yr 3, Direx)		31	31	37
Weed: Spot Spray (Roundup)			18	18
Prune: Dormant (hand)			122	176
Train: Sucker, Green Tie, Train			780	428
Train: Shoot Position/Thin				176
Insects: Mites (Acramite)				73
Disease: Mildew (Rally) 2X				55
Disease: Mildew (Sulfur Dust) 5X				44
Prune/Train: Trim Vines				12
Pickup Farm Use		25	25	59
ATV Farm Use		18	18	16
TOTAL CULTURAL COSTS		866	1,812	1,382
Harvest Costs:				
Hand Harvest Grapes				600
Haul to Crusher				72
Assessments/Dues				7
TOTAL HARVEST COSTS				679
Interest On Operating Capital @ 8.75%		294	434	51
TOTAL OPERATING COSTS/ACRE		4,484	6,558	2,112
Cash Overhead Costs:				
Office Expense		150	150	150
Liability Insurance		4	3	4
Sanitation Costs (Portable Toilets)		19	19	19
Manager's Salary		462	462	462
Reclamation Fee		30	30	30
Property Taxes		17	18	18
Property Insurance		73	74	74
Investment Repairs		61	61	61
TOTAL CASH OVERHEAD COSTS		814	816	817
TOTAL CASH COSTS/ACRE		5,298	7,375	2,929
INCOME/ACRE FROM PRODUCTION				2,200
NET CASH COSTS/ACRE FOR THE YEAR		5,298	7,375	729
PROFIT/ACRE ABOVE CASH COSTS				
ACCUMULATED NET CASH COSTS/ACRE		5,298	12,673	13,402

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Table 1. continued

	Cost Per Acre			Tons Per Acre:
	Year:	1st	2nd	
				4
Non-Cash Overhead (Capital Recovery):				
Buildings		38	38	38
Fuel Tanks		2	2	2
Tools: Shop/Field		7	7	7
Drip Irrigation System		104	104	104
Drainage System		96	513	513
Land		513	96	96
Equipment		27	47	56
TOTAL INTEREST ON INVESTMENT		787	807	816
TOTAL COST/ACRE FOR THE YEAR		6,085	8,182	3,745
INCOME/ACRE FROM PRODUCTION				2,200
TOTAL NET COST/ACRE FOR THE YEAR		6,085	8,182	1,545
NET PROFIT/ACRE ABOVE TOTAL COST				
TOTAL ACCUMULATED NET COST/ACRE		6,085	14,267	15,812

Notes: X = number of times as 2X = 2 times or passes

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE to PRODUCE WINEGRAPES
 SACRAMENTO VALLEY - Sacramento River Delta 2008

Operation	Cash and Labor Cost per acre						Total Cost	Your Cost
	Operation Time (Hrs/A)	Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/Rent			
Cultural:								
Weed: Winter Strip (Direx)	0.47	9	2	26	0		37	
Prune: Dormant	25.00	266	0	0	0		266	
Weed: Disc 4X	1.58	29	23	0	0		52	
Prune: Winter Tie	8.83	94	0	25	0		119	
Disease: Mildew (Thiolux), Phomopsis (Champ)	0.39	7	7	18	0		32	
Disease: Mildew (Sulfur Dust)	1.47	27	20	39	0		86	
Disease: Mildew (Rally)	0.78	14	14	41	0		69	
Prune: Trunk Suckering	5.50	59	0	0	0		59	
Canopy Mgmt: Shoot Removal/Positioning	16.50	176	0	0	0		176	
Irrigate: (pumping & labor)	5.50	59	0	34	0		93	
Fertilize: (N with irrigation) 5X	0.00	0	0	25	0		25	
Weed: Spray Vine Rows (Roundup)	1.41	26	5	22	0		53	
Fertilize: (K with irrigation) 4X	0.00	0	0	76	0		76	
Disease: Mildew (Flint)	0.79	14	14	58	0		86	
Canopy Mgmt: Green Tie (sucker, tie, train)	8.00	85	0	50	0		135	
Canopy Mgmt: Leaf Removal (hand)	16.50	176	0	0	0		176	
Canopy Mgmt: Trim Vines	0.34	6	6	0	0		12	
Insect: Mites (Acramite)	0.29	5	5	60	0		70	
PCA/Irrigation Monitoring Fees	0.00	0	0	0	49		49	
Pickup Truck Use	2.05	38	22	0	0		60	
ATV Use	0.86	16	2	0	0		18	
TOTAL CULTURAL COSTS	96.26	1,105	119	474	49		1,747	
Harvest:								
Machine Harvest Fruit	0.00	0	0	0	295		295	
Haul To Crusher	0.00	0	0	0	126		126	
Assessments/Dues	0.00	0	0	11	0		11	
TOTAL HARVEST COSTS	0.00	0	0	11	421		432	
Postharvest:								
Prune -Trim Vines	0.34	6	6	0	0		12	
Irrigate	1.10	12	0	8	0		20	
Fertilize N w/irrigation 5X	0.00	0	0	11	0		11	
Fertilize - Gypsum	0.00	0	0	48	0		48	
TOTAL POSTHARVEST COSTS	1.44	18	6	66	0		90	
Interest on operating capital @ 8.75%							70	
TOTAL OPERATING COSTS/ACRE		1,123	125	550	470		2,339	
CASH OVERHEAD:								
Office Expense							150	
Liability Insurance							4	
Sanitation Fees							19	
Manager Salary							462	
Crop Insurance							90	
Reclamation Fee							30	
Property Taxes							87	
Property Insurance							125	
Investment Repairs							74	
TOTAL CASH OVERHEAD COSTS							1,040	
TOTAL CASH COSTS/ACRE							3,379	

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			
Buildings, 2,400 sqft		431		38		38	
Fuel Tanks		23		2		2	
Tools-Shop/Field		77		7		7	
Drip Irrigation System		1,300		104		104	
Land		8,205		513		513	
Drainage System		1,200		96		96	
Vineyard Establishment		13,402		1,302		1,302	
Equipment		755		87		87	
TOTAL NON-CASH OVERHEAD COSTS		25,393		2,149		2,149	
TOTAL COSTS/ACRE						5,528	

Notes: X = number of times as 2X = 2 times or passes

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS PER ACRE to PRODUCE WINEGRAPES
 SACRAMENTO VALLEY - Sacramento River Delta 2008

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Wine Grape - Chardonnay	7.00	ton	550.00	3,850	
OPERATING COSTS					
Herbicide:					
Direx 4L	7.60	pint	3.45	26	
Roundup Ultra	6.00	pint	3.68	22	
Vine Aids:					
Tying Materials	3.00	acre	25.00	75	
Fungicides:					
Champ 2 Flowable	2.00	pint	5.37	11	
Thiolux Micro Sulfur	8.00	lb	0.90	7	
Sulfur Dust	150.00	lb	0.26	39	
Rally	8.00	oz	5.15	41	
Flint	4.00	oz	14.47	58	
Irrigation:					
Water (pumped)	16.00	acin	2.65	42	
Fertilizer/Soil Amendments:					
UN 32	40.00	lb N	0.88	35	
Potassium Sulfate	200.00	lb	0.38	76	
Gypsum (includes haul & spread)	0.50	ton	95.00	48	
Insecticide:					
Acramite	0.75	lb	79.65	60	
Contract/Custom:					
Machine Harvest	1.00	acre	295.00	295	
Haul to Crusher	7.00	ton	18.00	126	
PCA Fee	1.00	acre	35.00	35	
Irrigation Monitoring Fee	1.00	acre	14.00	14	
Assessment/Dues:					
Clarksburg Wine Growers & Vintners Association	1.00	acre	3.00	3	
Sharpshooter Program CDFA (\$0.002 x Gross Value)	3,850.00	Gval	0.00	8	
Labor (machine)	12.95	hrs	15.30	198	
Labor (non-machine)	86.93	hrs	10.64	925	
Fuel - Gas	6.96	gal	3.10	22	
Fuel - Diesel	23.86	gal	2.50	60	
Lube				12	
Machinery repair				32	
Interest on operating capital @ 8.75%				70	
TOTAL OPERATING COSTS/ACRE				2,339	
NET RETURNS ABOVE OPERATING COSTS				1,511	
CASH OVERHEAD COSTS:					
Office Expense				150	
Liability Insurance				4	
Sanitation Fees				19	
Manager Salary				462	
Crop Insurance				90	
Reclamation Fee				30	
Property Taxes				87	
Property Insurance				125	
Investment Repairs				74	
TOTAL CASH OVERHEAD COSTS/ACRE				1,040	
TOTAL CASH COSTS/ACRE				3,379	

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)					
Buildings, 2,400 sqft				38	
Fuel Tanks				2	
Tools-Shop/Field				7	
Drip Irrigation System				104	
Land				513	
Drainage System				96	
Vineyard Establishment				1,302	
Equipment				87	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				2,149	
TOTAL COSTS/ACRE				5,528	
NET RETURNS ABOVE TOTAL COSTS				-1,678	

UC COOPERATIVE EXTENSION

Table 4. MONTHLY CASH COSTS PER ACRE to PRODUCE WINEGRAPES
SACRAMENTO VALLEY - Sacramento River Delta 2008

Beginning JAN 08	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 08	08	08	08	08	08	08	08	08	08	08	08	08	
Cultural:													
Weed: Winter Strip (Direx)	37												37
Prune: Dormant	266												266
Weed: Disc 4X			13	13	13	13							52
Prune: Winter Tie			119										119
Disease: Mildew (Thiolux), Phomopsis (Champ)			32										32
Disease: Mildew (Sulfur Dust)				17	17	17	17	17					86
Disease: Mildew (Rally)				35		35							69
Prune: Trunk Suckering				59									59
Canopy Mgmt: Shoot Removal/Positioning					176								176
Irrigate: (pumping & labor)					18	18	19	19	18				93
Fertilize: (N with irrigation) 5X					4	5	7	9					25
Weed: Spray Vine Rows (Roundup)					18	18	18						53
Fertilize: (K with irrigation) 4X					19	19	19	19					76
Disease: Mildew (Flint)					43		43						86
Canopy Mgmt: Green Tie (sucker, tie, train)					68	68							135
Canopy Mgmt: Leaf Removal (hand)						176							176
Canopy Mgmt: Trim Vines						12							12
Insect: Mites (Acramite)						70							70
PCA/Irrigation Monitoring Fees	5	5	5	5	5	5	5	5	5	5			49
Pickup Truck Use	5	5	5	5	5	5	5	5	5	5	5	5	60
ATV Use	2	2	2	2	2	2	2	2	2	2			18
TOTAL CULTURAL COSTS	314	12	176	135	387	462	135	76	30	12	5	5	1,747
Harvest:													
Machine Harvest Fruit									295				295
Haul To Crusher									126				126
Assessments/Dues									11				11
TOTAL HARVEST COSTS	0	0	0	0	0	0	0	0	432	0	0	0	432
Postharvest:						0							
Prune -Trim Vines									12				12
Irrigate										20			20
Fertilize N w/irrigation 5X										11			11
Fertilize - Gypsum										48			48
TOTAL POSTHARVEST COSTS	0	0	0	0	0	0	0	0	12	78	0	0	90
Interest on operating capital @ 8.75%	2	2	4	5	7	11	12	12	16	-1	0	0	70
TOTAL OPERATING COSTS/ACRE	317	14	179	140	394	473	146	88	490	89	5	5	2,339

UC COOPERATIVE EXTENSION

Table 4. continued

Beginning JAN 08	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 08	08	08	08	08	08	08	08	08	08	08	08	08	
OVERHEAD:													
Office Expense	13	13	13	13	13	13	13	13	13	13	13	13	150
Liability Insurance		4											4
Sanitation Fees	2	2	2	2	2	2	2	2	2	2	2	2	19
Manager Salary	38	38	38	38	38	38	38	38	38	38	38	38	462
Crop Insurance		90											90
Reclamation Fee	3	3	3	3	3	3	3	3	3	3			30
Property Taxes	87												87
Property Insurance	62						62						125
Investment Repairs	6	6	6	6	6	6	6	6	6	6	6	6	74
TOTAL CASH OVERHEAD COSTS	211	156	62	62	62	62	124	62	62	62	59	59	1,040
TOTAL CASH COSTS/ACRE	527	170	241	201	456	534	270	150	551	150	64	64	3,379

UC COOPERATIVE EXTENSION
Table 5. RANGING ANALYSIS
 SACRAMENTO VALLEY - Sacramento River Delta 2008

COSTS PER ACRE AT VARYING YIELD TO PRODUCE WINEGRAPES

	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
OPERATING COSTS PER ACRE:							
Cultural Costs	1,747	1,747	1,747	1,747	1,747	1,747	1,747
Harvest Costs	385	403	421	439	458	475	493
Postharvest Costs	90	90	90	90	90	90	90
Assessments/Dues	9	10	11	12	13	14	15
Interest on operating capital @ 8.75%	70	70	70	71	71	71	71
TOTAL OPERATING COSTS/ACRE	2,301	2,320	2,339	2,359	2,379	2,397	2,416
Total Operating Costs/Ton	460	387	334	295	264	240	220
CASH OVERHEAD COSTS/ACRE	1,040	1,040	1,040	1,040	1,040	1,040	1,040
TOTAL CASH COSTS/ACRE	3,341	3,360	3,379	3,399	3,419	3,437	3,456
Total Cash Costs/Ton	668	560	483	425	380	344	314
NON-CASH OVERHEAD COSTS/ACRE	2,149	2,149	2,149	2,149	2,149	2,149	2,149
TOTAL COSTS/ACRE	5,490	5,509	5,528	5,548	5,568	5,586	5,605
Total Costs/Ton	1,098	918	790	694	619	559	510

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/ton	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
450.00	-51	380	811	1,241	1,671	2,103	2,534
550.00	449	980	1,511	2,041	2,571	3,103	3,634
650.00	949	1,580	2,211	2,841	3,471	4,103	4,734
750.00	1,449	2,180	2,911	3,641	4,371	5,103	5,834
850.00	1,949	2,780	3,611	4,441	5,271	6,103	6,934
950.00	2,449	3,380	4,311	5,241	6,171	7,103	8,034
1,050.00	2,949	3,980	5,011	6,041	7,071	8,103	9,134

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE \$/ton	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
450.00	-1,091	-660	-229	201	631	1,063	1,494
550.00	-591	-60	471	1,001	1,531	2,063	2,594
650.00	-91	540	1,171	1,801	2,431	3,063	3,694
750.00	409	1,140	1,871	2,601	3,331	4,063	4,794
850.00	909	1,740	2,571	3,401	4,231	5,063	5,894
950.00	1,409	2,340	3,271	4,201	5,131	6,063	6,994
1,050.00	1,909	2,940	3,971	5,001	6,031	7,063	8,094

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE \$/ton	YIELD (ton/acre)						
	5.00	6.00	7.00	8.00	9.00	10.00	11.00
450.00	-3,240	-2,809	-2,378	-1,948	-1,518	-1,086	-655
550.00	-2,740	-2,209	-1,678	-1,148	-618	-86	445
650.00	-2,240	-1,609	-978	-348	282	914	1,545
750.00	-1,740	-1,009	-278	452	1,182	1,914	2,645
850.00	-1,240	-409	422	1,252	2,082	2,914	3,745
950.00	-740	191	1,122	2,052	2,982	3,914	4,845
1,050.00	-240	791	1,822	2,852	3,882	4,914	5,945

UC COOPERATIVE EXTENSION

Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, & BUSINESS OVERHEAD COSTS
SACRAMENTO VALLEY - Sacramento River Delta 2008

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Cash Overhead			Total
					Capital Recovery	Insur- ance	Taxes	
08	70HP Vineyard Tractor	42,000	20	5,389	3,594	175	237	4,006
08	80HP Vineyard Tractor	40,000	20	5,132	3,423	167	226	3,815
08	ATV 4WD	6,700	5	3,003	1,071	36	49	1,156
08	Disc-Tandem 7 ft	5,500	8	1,242	770	25	34	829
08	Duster- 3 point	5,000	10	884	621	22	29	672
08	Air Blast Vineyard Sprayer 500 gal	24,000	10	4,244	2,981	105	141	3,227
08	Pickup 1/2 ton	26,000	7	9,863	3,533	133	179	3,845
08	Vine Trimmer	8,500	10	228	1,152	32	44	1,227
08	Weed Sprayer 200 gal	5,000	10	884	621	22	29	672
TOTAL		162,700		30,869	17,766	716	968	19,450
60% of New Cost*		97,620		18,521	10,660	430	581	11,670

*Used to reflect a mix of new and used equipment.

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Building 2,400 sqft	84,000	20		7,473	311	420	1,680	9,884
Drainage System	234,000	25		18,742	866	1,170	4,680	25,458
Drip Irrigation System	253,500	25		20,304	938	1,268	5,070	27,579
Fuel Tanks 2-500 gallon	4,500	20		400	17	23	90	529
Land	1,600,000	20	1,600,000	100,000	11,840	0	0	111,840
Tools-Shop/Field	15,000	20		1,334	56	75	300	1,765
Vineyard Establishment	804,100	17		78,133	2,975	4,021	804	85,933
TOTAL INVESTMENT	2,995,100		1,600,000	226,387	17,002	6,976	12,624	262,988

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Crop Insurance	195	acre	90.00	17,550
Liability Insurance	195	acre	3.97	774
Manager Salary	195	acre	461.53	90,000
Office Expense	195	acre	150.00	29,250
Reclamation Fee	195	acre	30.00	5,850
Sanitation Fees	195	acre	18.97	3,700

UC COOPERATIVE EXTENSION
Table 7. HOURLY EQUIPMENT COSTS
 SACRAMENTO VALLEY - Sacramento River Delta 2008

Yr Description	COSTS PER HOUR							
	Actual	Cash Overhead			Operating			Total
	Hours Used	Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
08 70HP Vineyard Tractor	600.00	3.59	0.18	0.24	1.70	9.88	11.58	15.59
08 80HP Vineyard Tractor	600.50	3.42	0.17	0.23	1.62	11.29	12.91	16.73
08 ATV 4WD	429.90	1.50	0.05	0.07	0.50	2.38	2.88	4.50
08 Disc-Tandem 7 ft	309.00	1.50	0.05	0.07	1.85	0.00	1.85	3.47
08 Duster- 3 point	120.20	3.10	0.11	0.15	0.70	0.00	0.70	4.06
08 Air Blast Vineyard Sprayer 500 gal	135.00	13.25	0.46	0.63	3.38	0.00	3.38	17.72
08 Pickup 1/2 ton	275.00	7.71	0.29	0.39	1.91	8.91	10.82	19.21
08 Vine Trimmer	200.30	3.45	0.10	0.13	3.52	0.00	3.52	7.20
08 Weed Sprayer 200 gal	120.00	3.10	0.11	0.15	0.7	0.00	0.70	4.06

UC COOPERATIVE EXTENSION
Table 8. OPERATIONS WITH EQUIPMENT
 SACRAMENTO VALLEY - Sacramento River Delta 2008

Operation	Operation Month	Tractor	Implement	Non-Machine Labor (hrs/acre)	Material	Broadcast Rate/acre	Unit
Cultural:							
Weed: Winter Strip (vine row)	Jan	ATV	Weed Sprayer		Direx	7.60	pint
Prune: Hand	Jan			25.00			
Weed: Disc 4X (disk prunings w/ March discing)	Mar	70HP 4WD	Disc 7'				
	Apr	70HP 4WD	Disc 7'				
	May	70HP 4WD	Disc 7'				
	June	70HP 4WD	Disc 7'				
Vine Management: Winter Tie	Mar			8.80	Tying Material		acre
Vine Management: Trunk Suckering	Apr			5.50			
Vine Management: Shoot Removal & Position	May			16.50			
Vine Management: Green Tie	May			4.00	Tying Material		acre
	June			4.00	Tying Material		
Vine Management: Leaf Removal	June			16.50			
Vine Management: Trim Vines	June	70HP 4WD	Vine Trimmer				
Vine Management: Trim Vines (post harvest)	Sept	70HP 4WD	Vine Trimmer				
Disease: Mildew & Phomopsis	Mar	80HP 4WD	Air Blast Sprayer		Champ	2.00	pt
					Thiolux	8.00	lb
Disease: Mildew (dust) 10X	Apr	70HP 4WD	Duster		Dusting Sulfur	30.00	lb
	May	70HP 4WD	Duster		Dusting Sulfur	30.00	lb
	June	70HP 4WD	Duster		Dusting Sulfur	30.00	lb
	July	70HP 4WD	Duster		Dusting Sulfur	30.00	lb
	Aug	70HP 4WD	Duster		Dusting Sulfur	30.00	lb
Disease: Mildew	Apr	80HP 4WD	Air Blast Sprayer		Rally	4.00	oz
	May	80HP 4WD	Air Blast Sprayer		Flint	2.00	oz
	June	80HP 4WD	Air Blast Sprayer		Rally	4.00	oz
	July	80HP 4WD	Air Blast Sprayer		Flint	2.00	oz
Insect: Mites	June	80HP 4WD	Air Blast Sprayer		Acramite	0.75	lb
Irrigate	May			1.10	Water	2.50	acin
	June			1.10	Water	2.50	acin
	July			1.10	Water	2.75	acin
	Aug			1.10	Water	2.75	acin
	Sept			1.10	Water	2.50	acin
Irrigate (post harvest)	Oct			1.10	Water	3.00	acin
Fertilize: through drip N	May				UN32	4.00	lb N
	June				UN32	6.00	lb N
	July				UN32	8.00	lb N
	Aug				UN32	10.00	lb N
Fertilize: through drip N (post harvest)	Oct				UN32	12.00	lb N
Fertilize: through drip K	May				Potassium Sulfate	50.00	lb
	June				Potassium Sulfate	50.00	lb
	July				Potassium Sulfate	50.00	lb
	Aug				Potassium Sulfate	50.00	lb
Weed: Vine Row and/or Spot Spray	May	ATV	Weed Sprayer		Roundup	2.00	pint
	June	ATV	Weed Sprayer		Roundup	2.00	pint
	July	ATV	Weed Sprayer		Roundup	2.00	pint
Harvest	Sept	Custom					
Haul	Sept	Custom					
Soil Amendment	Oct	Custom			Gypsum	0.50	ton