

2012

SAMPLE COSTS
TO ESTABLISH A VINEYARD AND PRODUCE
WINEGRAPES

Cabernet Sauvignon



San Joaquin Valley North
CRUSH DISTRICT 11
of San Joaquin and Sacramento Counties

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INTRODUCTION

Sample costs to establish a vineyard and produce winegrapes under drip irrigation in the northern San Joaquin Valley – Crush District 11 of Sacramento and San Joaquin 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 at <http://coststudies.ucdavis.edu>. They can also be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-4424 or obtained from selected county UC Cooperative Extension offices.

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ASSUMPTIONS

The assumptions refer to Tables 1 to 8 and pertain to sample costs to establish the vineyard and produce winegrapes in the northern San Joaquin Valley – Crush District 11 of Sacramento and San Joaquin counties. For district location and other related information, see the website <http://www.lodiwine.com>. 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 establishment and 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 200 contiguous acre farm, located on the valley floor in Crush District 11 of San Joaquin and Sacramento counties, is owned and operated by the grower. Sixty acres of winegrapes are being established and are the basis of this study. In addition, 135 acres of mature vineyards are in production, and roads, irrigation systems, fencing, and farmstead occupy five acres.

Establishment Cultural Practices and Material Inputs

The following practices refer to Table 1

Vineyard Conversion and Land 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, soil amendments may be added. The land is slip plowed in two different directions to a depth of 5-6 feet to break up hardpan, improve root penetration, water infiltration and also pull up additional roots remaining from the previous vines. The ground is then disced two times. The field is floated (triplaned) two times. The following spring the ground is cultivated (disced) two times with a pre-emergent, residual herbicide applied during the first discing and the material further incorporated with the second discing. All operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year. Custom or contract operators do all operations except the discing and herbicide application.

Fumigation: Because of costs and governmental restrictions, fumigation is not considered as a cost in this study. Fumigation costs may range from \$600 to \$3,200 per acre depending on materials and methods.

Soil Amendments: Fallow the land for a couple of years or go with alternative crops.

Vines. Potted benchgraft vines, Cabernet Sauvignon variety, are planted on a 5-foot x 11-foot spacing at 792 vines per acre. Vines are trained to a quadrilateral cordon height at 60 inches above ground and spur pruned. Cordons are the horizontal branches (separated between 24 and 36 inches) 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. The field is marked and laid out in the fall or spring (April). Planting starts in the spring (May) and is done by hand. The potted plants are placed in the planting hole and the soil formed around the roots. The following year an average of 2% or 13 vines per acre will be replanted. Replants at this level are furnished at no cost by the nursery.

Trellis System. A commercial trellis company installs the system. The cost in the study is for complete installation and includes materials and labor. The system is assumed to be installed between February and June and the 24-inch to 36-inch cross arms attached to each stake between June and October. The trellis system is designed to support a quadrilateral cordon trained to a horizontally divided canopy and spur pruned vineyard. The system in this study utilizes 125 gauge metal T-stakes at each vine with eight ten-foot end posts per acre at row ends to anchor the wires. The T-stakes can be installed at the time of survey and marking or any time prior to planting. Three permanent wires (11 gauge) are secured to the end posts and attached to the metal T-stakes. The drip line (13 gauge) is suspended from the bottom strand with drip clips. The trellis system is considered as part of the vineyard since it will be removed when the vines are removed; therefore, it is included as part of the establishment cost.

Training. Training and pruning establish the vine framework and these techniques will vary with variety and trellis system. In this study, training during the establishment years includes pruning, tying, suckering, shoot positioning, and shoot thinning. All operations are not done each year, nor are all the operations used for other training methods or trellis systems. The prunings during the first three years are placed in between the vine rows (vine middles) and are 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 buds to provide shoots of which one is selected for trunk development. The pruning takes approximately 18 man-hours. Green tying, which includes suckering, tying, and vine training is done in May, June, and July, but can be done from April through September. Green tying takes a total of 100 man-hours. Vines are trained by tying one shoot up the T-stake to become the main trunk. During the latter part of 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. Suckering is the removal of sprouts from the rootstock that compete with the main trunk and cordons for water and nutrients.

Third Year. Green tying at 33.15 man-hours (including suckering) in May and June continues by extending the cordons along the permanent cordon wire and selecting spur positions. Dormant canes from spurs are pruned to 2-bud spur taking 16.57 man-hours. Slower growing vines continue to be trained; however, year three is the last year that the vines are trained in this study. After the vines are trained, canopy management including shoot positioning, thinning, and suckering trunks and cordons is done in June and takes 16.50 man-hours. The vines are mechanically trimmed in September prior to harvest.

Irrigation. Irrigation costs in the tables include pumped water plus labor. Water is calculated to cost \$100.00 per acre-foot (\$8.33 per acre inch). Assume six inches of stored rainfall from an average of 17 inches of annual winter/spring rains. 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			
AcIn/Year			
Year	Preharvest	Postharvest	Total
1	6	0	6
2	12	0	12
3+	15	3	18

Drip System. Mainlines are laid out in the fall. The drip line is laid on top of the ground. After planting the drip line is attached to the drip wire on the trellis system. If needed, the ground is preirrigated to ease the hand digging for the planting hole. The drip system includes the tape or drip line, laterals, fertilizer injectors, filters, and the installation labor. The labor also includes laying out the line and hanging it on the bottom trellis wire. The cost is shown under Non-Cash Overhead (Investments).

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. Nursery materials should be checked to prevent invasive species such as vine mealy bug (VMB), light brown apple moth (LBAM), and European grapevine moth (EGVM). Many insects attack grapevines, therefore monitoring begins in the first year. Leafhoppers (*Erythroneura elegantula* and *E. variabilis*) can cause serious problems and are controlled with Provado (neonicotinoid) insecticide beginning in June of the third year. The material is applied with the grower’s tractor and vineyard sprayer.

Diseases. Several primary pathogens attack grapevines, but the major disease assumed is powdery mildew (*Uncinula necator*). Powdery mildew control begins in April of the third year, but timing depends upon the disease pressure, which can vary from year to year. Sulfur dust is applied five times and Rally, a sterol inhibitor, one time and Flint, a strobilurine, one time. Also, *Eutypa* dieback sensitive variety such as Cabernet Sauvignon may benefit from Rally/Topsin-M applied immediately after pruning beginning in the second or third year.

Weeds. Prior to planting, Treflan, a preemergent herbicide, is applied with a spray boom attached to the front of a disc. Incorporation is completed with a second discing. The row middles are cultivated (disced) three to five times per season during the establishment years. The vine rows are sprayed in late fall or winter during the first two years with a combination of herbicides such as Prowl, Goal and Roundup. Also, during the first two years, the vine rows are hand weeded and assumed to take 3.50 man-hours each year. Surflan, Goal and Roundup are applied to the vine rows in the winter (winter strip spray) beginning in the third year. Summer weed control in the vine row begins in the second year with Rely herbicide applied by the grower.

Vertebrate. Jackrabbits are the major pest, although cottontail, brush rabbit, pocket gophers, squirrels, voles (meadow mice), and coyotes 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. Liquid fertilizer, 5-0-12, (9.6 lbs/gal) is applied through the drip line at 500 pounds (52 gallons) per acre per year during the first three years. This applies nitrogen at 25 pounds per acre and potassium at 60 pounds per acre.

Harvesting. Harvesting starts in the third year. In this study the crop is custom harvested by machine. Hauling to the winery is contracted and the grower pays both the harvest and hauling costs.

Year:	3	4+
Tons Per Acre:	5.0	10.0

Yield. Typical annual yields for Cabernet Sauvignon in Crush District 11 are shown in Table B.

Production Cultural Practices and Material Inputs

Refers to Tables 2 - 8

Vine Management (VM)/Prune. Hand pruning at 30 man-hours per acre is done during the winter months (February). The prunings are placed in the row middles and chopped/shredded. The prunings are incorporated into the soil during the first discing in March. Winter tying at 5.0 man-hours per acre, 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 (3.0 man-hours) is done in April; shoot removal (16.5 man-hours) in May. The vines are

mechanically trimmed (skirted) in June. A more severe trimming is done prior to harvest in September to facilitate fruit removal by the machine harvester. 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. If needed, the clusters may be thinned (cluster thinning) later in the season to reduce crop load or remove clusters that may be delayed in maturity. Other varieties may require cluster thinning due to compactness. In some plantings, 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.

Fertilization. Fertilizer can be applied through the drip system throughout the year. In this study, assuming a 10 ton yield, fertilizer (5-0-12) containing nitrogen (Urea) and potassium (KTS) is applied equally in May and October at 300 pounds (81 gallons) per acre. This supplies 75 pounds of N and 130 pounds of K per acre per application. Labor costs for applying the fertilizer are assumed to be included in the irrigation labor.

Irrigation. Irrigation costs in the tables include pumped water and irrigation labor. The water is calculated to cost \$100.00 per acre-foot (\$8.33/acre-inch) based on pumping costs as provided by the growers. Fifteen acre-inches are applied during the growing season beginning in April and three acre-inches are applied post harvest (October/November). No assumption is made about effective rainfall. The average rainfall in the area is 17 to 18 inches. Irrigation labor is averaged over the season, although extra time may be required during the first irrigation to flush and check the system, and make any necessary repairs.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Grapes*. For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. Information and pesticide use permits are available through the local county Agricultural Commissioner's office. Pesticides mentioned in this study are used to calculate rates and costs. Although growers commonly use the pesticides mentioned, other pesticides are available. Spray adjuvants are recommended for use with many pesticides, but are not accounted for in this study. Pesticide costs vary by location, brand, and grower volume. Pesticide costs in this study are from dealers in the region.

Pest Control Adviser (PCA). The PCA monitors the field for agronomic problems including pests, diseases, and nutritional status. Growers may hire private consultants on a per acre basis or receive the service as part of an agreement with an agricultural chemical and fertilizer company. Separate costs for a PCA are not included in this study.

Weeds. Herbicide choice is a function of weed pressure, which can change over time. In this vineyard vine row weeds (strip spray) are controlled with a tank mix of Prowl H2O, Goal, and Roundup applied during December or January. Rely herbicide is used primarily for summer weed control in the vine row as a strip or spot spray. It is assumed that although the spray applicator drives every row, material applied to the vine row amounts to 40% of the field acreage. Resident vegetation in the row middles is managed with one mowing in March, at which time the prunings are shredded, and with four discings per season – March, April, June, October.

Insects. Grape leafhopper (*Erythroneura elegantula*), variegated leafhopper (*Erythroneura variabilis*), Pacific spider mite (*Tetranychus pacificus*) and Willamette spider mite (*Eotetranychus willamettei*) are the most

important insects in the area. In this study Provado is applied in June (combined with mildew spray) to control leafhoppers. Mites are controlled with Acramite in July (combined with mildew spray). Incidental pests such as omnivorous leafroller (OLR), leaf folder, grape mealybug, and thrips are not accounted for, but may require an additional material for control in one of the spray applications or as an additional spray application. Vine mealybug, a new pest, may need to be controlled midseason (May, June) with Movento or Admire. For control of light brown apple moth (LBAM) and European grape vine moth (EGVM) and Regulatory Compliance, contact your Ag Commissioner.

Diseases. Many diseases attack grapevines, but the major disease assumed in this study is powdery mildew (*Uncinula necator*). Powdery mildew treatments begin in mid-April with dusting sulfur applications at 7 to 14 day intervals, and by two fungicide applications (Rally and Adament), each with different modes of action. Rally (sterol inhibitor) is applied in June and Adament (strobilurine) in July. Dusting sulfur is applied from April to July.

Harvest. The crop is machine harvested by a custom operator and costs \$325 per acre. Hauling to the winery is contracted and the grower pays \$18 per ton for local hauls. Additional charges will apply to hauls considered being out of the local area.

Yields. Yield maturity is reached in the fourth year. An assumed average yield of 10.0 tons per acre is used to calculate yields over the production years. Yield range for Cabernet Sauvignon in Crush District 11 is 8.0 to 12.0 tons per acre and is affected by variations in vine spacing and trellis systems. Annual yields are measured in tons as shown in Table B.

Returns. Return prices per ton for winegrapes are determined by variety and percent sugar (Brix). During the harvest season, Brix ranges from a low at the beginning of harvest and gradually increases and is higher toward the end of the harvest. Use of return prices for grapes is for calculating net returns to growers at different yields and price as shown in the Ranging Analysis Table. The 2007 to 2011 weighted average price (Crush Report, Table 8) used in this study is \$480 per ton for Cabernet Sauvignon winegrapes.

Assessments (Fee, Taxes). The Lodi Winegrape Commission supports winegrape promotion, research, and education for Crush District 11 growers. The commission assesses growers \$0.0045 (\$4.50 per \$1,000) on the gross crop returns (yield x returns). A mandatory assessment by the California Department of Food and Agriculture (CDFA) assesses growers \$0.001 (\$1.00 per \$1,000) on the gross crop returns to support the Pierces Disease/Glassy Winged Sharpshooter Insect program. The California Association of Winegrape Growers (CAWG) is a voluntary organization that represents growers on state and federal political issues.

Pickup/ATV. It is assumed that the pickup is used for business and personal use. Time and mileage use for the pickup and ATV are not taken from any specific data.

Labor, Equipment and Interest

Labor. Labor rates of \$16.08 per hour for machine operators and \$13.40 for general labor includes payroll overhead of 34%. The basic hourly wages are \$12.00 for machine operators and \$10.00 for general labor. The overhead includes the employers' share of federal and California state payroll taxes, workers' compensation insurance for vineyards (code 0044), and a percentage for other possible benefits. 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, 2012 (personal email from California Department of Insurance, March 2012, 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.

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 5.75% 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 rate will vary depending upon various factors, but the rate in this study is considered a typical lending rate by a farm lending agency as of January 2012.

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 power takeoff (PTO) horsepower, and fuel type. Prices for on-farm delivery of red-dye diesel and gasoline are \$3.43 (excludes excise taxes) and \$3.82 per gallon, respectively. The price is the average for 2011, based on the 2011, Department of Energy (DOE) monthly data. The cost may include a 2.5% local sales tax on diesel fuel and 7.5% sales tax on gasoline. Gasoline also includes federal and state excise tax, which are refundable for on-farm use when filing your income tax. 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.

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. Growers may purchase Federal crop insurance to reduce the production risk associated with specific natural hazards. Insurance policies vary and range from a basic catastrophic loss policy to one that insures losses for up to 75% of a crop. Insurance costs will depend on the type and level of coverage.

Cash Overhead

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 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 0.803% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$842 for the entire farm.

Office Expense. Office and business expenses are estimated at \$130 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges. The expense also includes annual fees imposed by government agencies and are listed below:

California Air Resources Board Mitigation Plan Fee. Each grower with 100 contiguous acres is required to submit an annual plan to the California Air Resources Board (CARB), as to practices or operations to reduce particulate matter from roadways and agricultural operations. This fee is \$100 per site.

Agricultural Water Discharge Monitoring. Each grower is required to join a Water Coalition or provide their own monitoring and data collected to the Regional Water Quality Control Board (RWQCB). Each site under a growers operation is assessed a per acre fee in order to set up monitoring sites representative of the Water Coalitions to which the grower belongs. These sites are monitored and periodically collected samples are analyzed by independent laboratory as to listed containments of concern. Results are reported to the RWQCB. The fee depends on the Water Coalition district established, but is \$2.50 per acre in this case.

County Agricultural Commissioner Pesticide Storage Fee. Each grower is required to report to the local County Ag Commissioner, all pesticides stored on an annual basis above established minimums for registering in case of a fire or natural disaster. The fee is \$100 per site.

Sanitation Services. Sanitation services provide portable toilets for the vineyard and cost the farm \$2,304 annually. The cost includes a double toilet, delivery and 9 months of weekly service.

Crop Insurance. The cost of \$300 per unit (variety) is the basic catastrophic rate paid by the growers. Insurance policies vary and range from a basic catastrophic loss policy to one that insures losses for up to 75% of a crop. Insurance costs will depend on the type and level of coverage ranging from 50 to 75% of predetermined yield.

Management/Supervisor Wages. A salary for a farm manager for the 200-acre farm is included to indicate that a cash cost for professional supervision of the vineyard is incurred. An expense of \$68,500 per year that includes 34% for payroll overhead and insurance benefits is used in this study.

Investment Repairs. Annual maintenance is calculated as 2% of the purchase price except on vineyard establishment which is 0.5% to cover costs for vine replacement and trellis repairs.

Non-Cash Overhead

Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Farm equipment in the region is purchased new or used.

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. An interest rate of 4.75% is used to calculate capital recovery. The rate will vary depending upon loan amount and other lending agency conditions, but is the basic suggested rate by a farm lending agency as of January 2012.

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, drip 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 \$15,675 per acre or \$940,500 for the 60-acre vineyard. The establishment cost is spread over the remaining 22 years of the 25 years the vineyard is in production. Annual vineyard maintenance (vines and trellis) is calculated at 0.5% of the establishment costs.

Irrigation System. The well, a 40 horsepower (HP) pump and the installation labor are included in the irrigation system cost. This well and pump serve only the 60-acre vineyard. Other well(s) are used on the remaining property and are not included. Water is pumped from a 120-foot depth. The irrigation system is considered an improvement to the property and has a 25-year life.

Land. Bare land in the Lodi area may be valued from \$11,000 to \$30,000 per acre. For this study the land is valued at \$13,000 per acre or \$13,333 per planted (195) acres. (2011 Trends in Agricultural Land and grower input).

Building. The shop building(s) consists of 2,400 square feet of 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 Costs. 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 in the Whole Farm Equipment, Investment and Business Overhead Tables. 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.

UC COOPERATIVE EXTENSION
Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A VINEYARD
 SAN JOAQUIN VALLEY NORTH – (Crush District 11) 2012

	Cost Per Acre			Tons Per Acre:
	Year:	1st	2nd	
				5
Planting Costs:				
Land Prep: Vineyard Removal		450		
Land Prep: - Slip Plow 2X		600		
Land Prep: Disc 2X		80		
Land Prep: Triplane 2X		70		
Land Prep: Apply Herbicide (Treflan) & Incorporate		40		
Plant: Mark & Layout vineyard		131		
Plant: Dig Hole, Plant, Place milk cartons (includes cartons)		483	32	
Vines: 792 Per Acre (2% Replant In 2nd Year) (No cost for replants)		2,376		
TOTAL PLANTING COSTS		4,230	32	
Trellis & Drip System Costs:				
Install Trellis (custom)		5,616		
Install Drip System (See Overhead)				
TOTAL TRELLIS & DRIP SYSTEM COSTS		5,616		
Cultural Costs:				
Prune: Prune vines by hand			241	222
Irrigate: Pumping & Labor		104	167	217
Fertilizer: 5-0-12		65	65	65
Train: Green Tie (Sucker, Tie & Train)			1,385	715
Weed: Winter Strip Spray (Yrs 1-2, Prowl, Goal, Roundup, Yr 3, Surflan, Goal, Roundup)		97	97	114
Weed: Hand Weed		34	34	
Weed: Disc (3X 1st Year, 5X Year 2+)		39	65	65
Weed: Summer Strip Spray (Rely)			28	28
Disease: Eutypa (Rally, Topsin)			79	79
Insect: Leafhoppers (Provado)				30
Train: Shoot Positioning/Thin				224
Disease: Mildew 6X (Dusting Sulfur)				67
Disease: Mildew 1X (Rally)				37
Disease: Mildew: 1X (Flint)				50
Train: Trim Vines				15
Pickup Truck Use		35	35	35
ATV Use		18	18	18
TOTAL CULTURAL COSTS		391	2,213	1,982
Harvest Costs:				
Pick Fruit				325
Haul To Crusher				90
TOTAL HARVEST COSTS				415
Assessments:				
Lodi Winegrape Commission & CDFA Sharpshooter				13
TOTAL ASSESSMENT COSTS				13
Interest On Operating Capital @ 5.75%		419	51	49
TOTAL OPERATING COSTS/ACRE		10,656	2,296	2,460

UC COOPERATIVE EXTENSION

Table 1. continued

	Cost Per Acre			
	Year:	1st	2nd	3rd
	Tons Per Acre:			5
Cash Overhead Costs:				
Office Expense		130	130	130
Liability Insurance		4	4	4
Sanitation Fees		38	38	38
Managers Salary		351	351	351
Property Taxes		150	152	152
Property Insurance		121	122	122
Investment Repairs		90	91	91
TOTAL CASH OVERHEAD COSTS		885	889	889
TOTAL CASH COSTS/ACRE		11,541	3,185	3,349
INCOME/ACRE FROM PRODUCTION				2,400
NET CASH COSTS/ACRE FOR THE YEAR		11,541	3,185	949
PROFIT/ACRE ABOVE CASH COSTS				
ACCUMULATED NET CASH COSTS/ACRE		11,541	14,726	15,675
Non-Cash Overhead (Capital Recovery):				
Building (s)		26	26	26
Fuel Tanks		1	1	1
Shop/Field Tools		7	7	7
Drip Irrigation System (drip, filters, injection)		111	111	111
Pumping Station (pump, well)		86	86	86
Land		633	633	633
Equipment		26	97	105
TOTAL INTEREST ON INVESTMENT		891	961	969
TOTAL COST/ACRE FOR THE YEAR		12,432	4,146	4,317
INCOME/ACRE FROM PRODUCTION				2,400
TOTAL NET COST/ACRE FOR THE YEAR		12,432	4,146	1,917
NET PROFIT/ACRE ABOVE TOTAL COST				
TOTAL ACCUMULATED NET COST/ACRE		12,432	16,578	18,495

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE to PRODUCE WINE GRAPES
 SAN JOAQUIN VALLEY NORTH – (Crush District 11) 2012

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre					Total Cost	Your Cost
		Labor Cost	Fuel	Lube & Repair	Material Cost	Custom/ Rent		
Cultural:								
Weed: Winter Strip (Surflan, Goal, Roundup)	0.43	8	2	1	84	0	96	
*Prune/VM: Hand	30.00	402	0	0	0	0	402	
Prune/VM: Chop/Shred Prunings	0.19	4	3	2	0	0	9	
Weed: Disc 4X	1.25	24	21	7	0	0	52	
Prune/VM: Winter Tie	5.00	67	0	0	15	0	82	
Prune/VM: Trunk Sucker	3.00	40	0	0	0	0	40	
Disease: Mildew 6X (Sulfur Dust)	1.70	33	9	5	25	0	72	
Irrigate:	5.00	67	0	0	150	0	217	
Prune/VM: Shoot Removal/Shoot Position	16.50	221	0	0	0	0	221	
Fertilize: through drip 2X (5-0-12)	0.00	0	0	0	78	0	78	
Prune/VM: Trim Vines (mechanical)	0.69	13	11	6	0	0	31	
Disease: Mildew (Rally). Insect: Leafhopper (Provado), VMB (Movento)	0.36	7	6	2	115	0	130	
Weed: Summer Strip Spray (Rely)	0.43	8	2	1	15	0	26	
Disease: Mildew (Adament). Insect: Mites (Acramite)	0.36	7	6	2	98	0	114	
Pickup Truck Use	0.86	17	15	4	0	0	36	
ATV Use	0.86	17	1	1	0	0	18	
TOTAL CULTURAL COSTS	66.63	935	78	31	580	0	1,623	
Harvest:								
Machine Harvest Fruit	0.00	0		0	0	325	325	
Haul To Winery	0.00	0		0	0	180	180	
TOTAL HARVEST COSTS	0.00	0	0	0	0	505	505	
Assessment:								
Crop Assessments	0.00	0		0	26	0	26	
TOTAL ASSESSMENT COSTS	0.00	0	0	0	26	0	26	
Interest on operating capital @ 5.75%							44	
TOTAL OPERATING COSTS/ACRE		935	78	31	606	505	2,199	
CASH OVERHEAD:								
Office Expense							130	
Liability Insurance							4	
Sanitation Fees							38	
Manager Salary							351	
Crop Insurance							5	
Property Taxes							230	
Property Insurance							185	
Investment Repairs							169	
TOTAL CASH OVERHEAD COSTS							1,113	
TOTAL CASH COSTS/ACRE							3,312	
NON-CASH OVERHEAD:								
		Per producing Acres		Annual Cost Capital Recovery				
Building 2,400 sq ft'		410		26			26	
Fuel Tanks 2 - 500 gal		18		1			1	
Tools-Shop/Field		72		7			7	
Drip System (drip, filters, injectors)		1,600		111			111	
Pumping System (well, pump)		1,250		86			86	
Land		13,333		633			633	
Vineyard Establishment		15,675		1,164			1,164	
Equipment		1,006		98			98	
TOTAL NON-CASH OVERHEAD COSTS		33,364		2,126			2,126	
TOTAL COSTS/ACRE							5,438	

*Heading indicates paragraph describing operation (VM=Vine Management).

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS PER ACRE to PRODUCE WINE GRAPES
 SAN JOAQUIN VALLEY NORTH – (Crush District 11) 2012

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Wine Grape - Cabernet Sauvignon	10.00	ton	480.00	4,800	
OPERATING COSTS					
Herbicide:					
Goal 2XL	2.40	pint	17.25	41	
Prowl H2O	4.00	pint	7.63	31	
Roundup Weather Max	1.20	pint	10.00	12	
Rely 200	1.50	pint	9.72	15	
Vine Aids:					
Tying Materials	1.00	acre	15.00	15	
Fungicide:					
Dusting Sulfur	90.00	lb	0.28	25	
Rally	4.00	oz	4.75	19	
Adament 50WS	3.00	oz	9.09	27	
Water:					
Water-Pumped	18.00	acin	8.33	150	
Fertilizer:					
5-0-12 (liquid fertilizer)	600.00	lb	0.13	78	
Insecticide:					
Provado 1.6 Flowable	4.00	floz	3.74	15	
Movento	8.00	floz	10.07	81	
Acramite 50WS	16.00	oz	4.45	71	
Custom:					
Machine Harvest	1.00	acre	325.00	325	
Haul to Crusher	10.00	ton	18.00	180	
Assessment:					
Lodi Winegrape Commission (\$0.0045 x gross value)	4,800.00	gval	0.00	22	
Sharpshooter Program CDFA \$0.001 x gross value)	4,800.00	gval	0.00	5	
Labor (machine)	8.55	hrs	16.08	137	
Labor (non-machine)	59.50	hrs	13.40	797	
Fuel - Gas	4.25	gal	3.82	16	
Fuel - Diesel	17.95	gal	3.43	62	
Lube				12	
Machinery repair				19	
Interest on operating capital @ 5.75%				44	
TOTAL OPERATING COSTS/ACRE				2,199	
NET RETURNS ABOVE OPERATING COSTS				2,601	
CASH OVERHEAD COSTS:					
Office Expense				130	
Liability Insurance				4	
Sanitation Fees				38	
Manager Salary				351	
Crop Insurance				5	
Property Taxes				230	
Property Insurance				185	
Investment Repairs				169	
TOTAL CASH OVERHEAD COSTS/ACRE				1,113	
TOTAL CASH COSTS/ACRE				3,312	
NET RETURNS ABOVE CASH COSTS/ACRE				1,488	

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 2,400 sq ft'				26	
Fuel Tanks 2 - 500 gal				1	
Tools-Shop/Field				7	
Drip System (drip, filters, injectors)				111	
Pumping System (well, pump)				86	
Land				633	
Vineyard Establishment				1,164	
Equipment				98	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				2,126	
TOTAL COSTS/ACRE				5,438	
NET RETURNS ABOVE TOTAL COSTS				-638	

UC COOPERATIVE EXTENSION
Table 4. MONTHLY CASH COSTS PER ACRE to PRODUCE WINEGRAPES
 SAN JOAQUIN VALLEY NORTH – (Crush District 11) 2012

Beginning JAN 12	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 12	12	12	12	12	12	12	12	12	12	12	12	12	
Cultural:													
Weed: Winter Strip (Surflan, Goal, Roundup)	96												96
*Prune/VM: Hand		402											402
Prune/VM: Chop/Shred Prunings			9										9
Weed: Disc 4X			13	13		13				13			52
Prune/VM: Winter Tie			82										82
Prune/VM: Trunk Sucker				40									40
Disease: Mildew 6X (Sulfur Dust)				12	36	12	12						72
Irrigate: (water, labor)				23	28	43	43	43	19	19			217
Prune/VM: Shoot Removal/Shoot Position					221								221
Fertilize: through drip 2X (5-0-12)					39					39			78
Prune/VM: Trim Vines (mechanical)						15			15				31
Disease: Mildew (Rally). Insect: Leafhopper (Provado), VMB (Movento)						130							130
Weed: Summer Strip Spray (Rely)						26							26
Disease: Mildew (Adament). Insect: Mites (Acramite)							114						114
Pickup Truck Use	3	3	3	3	3	3	3	3	3	3	3	3	36
ATV Use	2	2	2	2	2	2	2	2	2	2	2	2	18
TOTAL CULTURAL COSTS	100	407	108	93	328	244	173	47	39	76	5	5	1,623
Harvest:													
Machine Harvest Fruit									325				325
Haul To Winery									180				180
TOTAL HARVEST COSTS									505				505
Assessment:													
Crop Assessments									26				26
TOTAL ASSESSMENT COSTS									26				26
Interest on operating capital @ 5.75%	0	2	3	3	5	6	7	7	10	0	0	0	44
TOTAL OPERATING COSTS/ACRE	101	409	111	96	333	250	180	54	581	75	4	5	2,199
OVERHEAD:													
Office Expense	11	11	11	11	11	11	11	11	11	11	11	11	130
Liability Insurance		4											4
Sanitation Fees	4	4	4	4	4	4	4	4	4	4			38
Manager Salary	29	29	29	29	29	29	29	29	29	29	29	29	351
Crop Insurance				5									5
Property Taxes		115					115						230
Property Insurance		185											185
Investment Repairs	14	14	14	14	14	14	14	14	14	14	14	14	169
TOTAL CASH OVERHEAD COSTS	58	362	58	63	58	58	173	58	58	58	54	54	1,113
TOTAL CASH COSTS/ACRE	159	771	169	159	391	308	353	112	639	133	59	59	3,312

*Heading indicates paragraph describing operation (VM=Vine Management).

UC COOPERATIVE EXTENSION
Table 5. RANGING ANALYSIS
 SAN JOAQUIN VALLEY NORTH – (Crush District 11) 2012

COSTS PER ACRE AT VARYING YIELD TO PRODUCE WINE GRAPES

	YIELD (ton/acre)						
	7.00	8.00	9.00	10.00	11.00	12.00	13.00
OPERATING COSTS:							
Cultural Cost	1,623	1,623	1,623	1,623	1,623	1,623	1,623
Harvest Cost	469	490	511	531	552	573	593
Interest on operating capital @ 5.75%	44	44	44	44	44	44	44
TOTAL OPERATING COSTS/ACRE	2,136	2,157	2,178	2,199	2,219	2,240	2,261
Total Operating Costs/ton	305	270	242	220	202	187	174
CASH OVERHEAD COSTS/ACRE							
TOTAL CASH COSTS/ACRE	3,248	3,269	3,289	3,310	3,331	3,352	3,372
Total Cash Costs/ton	464	409	365	331	303	279	259
NON-CASH OVERHEAD COSTS/ACRE							
TOTAL COSTS/ACRE	5,319	5,340	5,361	5,381	5,402	5,423	5,444
Total Costs/ton	760	667	596	538	491	452	419

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/ton	YIELD (ton/acre)						
	7.00	8.00	9.00	10.00	11.00	12.00	13.00
330	174	483	792	1,101	1,411	1,720	2,029
380	524	883	1,242	1,601	1,961	2,320	2,679
430	874	1,283	1,692	2,101	2,511	2,920	3,329
480	1,224	1,683	2,142	2,601	3,061	3,520	3,979
530	1,574	2,083	2,592	3,101	3,611	4,120	4,629
580	1,924	2,483	3,042	3,601	4,161	4,720	5,279
630	2,274	2,883	3,492	4,101	4,711	5,320	5,929
680	2,624	3,283	3,942	4,601	5,261	5,920	6,579

NET RETURNS PER ACRE ABOVE CASH COST

PRICE \$/ton	YIELD (ton/acre)						
	7.00	8.00	9.00	10.00	11.00	12.00	13.00
330	-938	-629	-319	-10	299	608	918
380	-588	-229	131	490	849	1,208	1,568
430	-238	171	581	990	1,399	1,808	2,218
480	112	571	1,031	1,490	1,949	2,408	2,868
530	462	971	1,481	1,990	2,499	3,008	3,518
580	812	1,371	1,931	2,490	3,049	3,608	4,168
630	1,162	1,771	2,381	2,990	3,599	4,208	4,818
680	1,512	2,171	2,831	3,490	4,149	4,808	5,468

NET RETURNS PER ACRE ABOVE TOTAL COST

PRICE \$/ton	YIELD (ton/acre)						
	7.00	8.00	9.00	10.00	11.00	12.00	13.00
330	-3,009	-2,700	-2,391	-2,081	-1,772	-1,463	-1,154
380	-2,659	-2,300	-1,941	-1,581	-1,222	-863	-504
430	-2,309	-1,900	-1,491	-1,081	-672	-263	146
480	-1,959	-1,500	-1,041	-581	-122	337	796
530	-1,609	-1,100	-591	-81	428	937	1,446
580	-1,259	-700	-141	419	978	1,537	2,096
630	-909	-300	309	919	1,528	2,137	2,746
680	-559	100	759	1,419	2,078	2,737	3,396

UC COOPERATIVE EXTENSION
Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
 SAN JOAQUIN VALLEY NORTH – (Crush District 11) 2012

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
						Insur- ance	Taxes		
12	90 HP 4WD Tractor	55,000	15	10,707	4,704	264	329		5,296
12	30 HP 4WD Tractor	19,305	15	3,758	1,651	93	115		1,859
12	ATV 4WD	7,700	5	3,451	1,139	45	56		1,239
12	Disc - Tandem 8'	8,500	10	1,503	967	40	50		1,057
12	Duster - 3 Pt	6,000	5	1,954	1,021	32	40		1,093
12	Mower - Flail 8'	12,000	15	1,152	1,082	53	66		1,201
12	Vineyard Sprayer 400 gal	20,000	5	3,537	2,274	95	118		2,486
12	Pickup Truck 1/2 T	28,000	7	10,621	3,481	155	193		3,829
12	Vine Trimmer	12,000	10	2,122	1,365	57	71		1,492
12	Weed Sprayer 200 gal	4,000	5	1,303	681	21	27		728
TOTAL		172,505		40,109	18,363	854	1,063		20,280
60	% of New Cost *	103,503	0	24,066	11,018	512	638		12,168

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes	Repairs	
Building 2,400 sqft	80,000	30		5,057	321	400	1,600	7,378
Drip Irrigation System (drip, filters, injectors)	96,000	25		6,642	385	480	4,863	12,370
Fuel Tanks 2-500 gallon	3,500	25	1,295	214	19	24	70	327
Land (200 acres)	2,600,000	25	2,600,000	123,500	20,878	26,000	0	170,378
Pumping Station (pump, well) (60 acres)	75,000	25		5,189	301	375	0	5,865
Tools-Shop/Field	14,000	15		1,326	56	70	240	1,692
Vineyard Establishment	940,500	22		69,831	3,776	4,703	4,702	83,011
TOTAL INVESTMENT	3,809,000		2,601,295	211,758	25,737	32,051	11,475	281,022

UC COOPERATIVE EXTENSION
Table 7. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY NORTH – (Crush District 11) 2012

Yr	Description	Grape Hours Used	Total Hours Used	COSTS PER HOUR						Total Costs/Hr.
				Capital Recovery	Cash Overhead		Operating		Total	
					Insur- ance	Taxes	Repairs	Fuel & Lube		
12	90 HP 4WD Tractor	187	1,066	2.65	0.15	0.18	3.68	15.16	18.84	21.82
12	30 HP 4WD Tractor	169	579	1.71	0.10	0.12	1.95	5.05	7.00	8.93
12	ATV 4WD	52	169	4.05	0.16	0.20	1.55	1.27	2.82	7.23
12	Disc - Tandem 8'	75	200	2.90	0.12	0.15	1.40	0.00	1.40	4.57
12	Duster - 3 Pt	102	293	2.09	0.07	0.08	0.72	0.00	0.72	2.96
12	Mower - Flail 8'	11	133	4.88	0.24	0.30	5.60	0.00	5.60	11.02
12	Vineyard Sprayer 400 gal	43	469	2.91	0.12	0.15	0.73	0.00	0.73	3.91
12	Pickup Truck 1/2 T	52	169	12.37	0.55	0.69	6.12	17.51	23.63	37.24
12	Vine Trimmer	41	134	6.10	0.25	0.32	7.54	0.00	7.54	14.21
12	Weed Sprayer 200 gal	52	234	1.75	0.05	0.07	0.60	0.00	0.60	2.47

UC COOPERATIVE EXTENSION

Table 8. OPERATIONS WITH EQUIPMENT AND MATERIALS.
SAN JOAQUIN VALLEY NORTH – (Crush District 11) 2012

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Weed: WinterStrip(SurfGoalRndu)	Jan	30 HP 4WD	Weed Sprayer 200 G	Equipment Operator Labor	0.52	hour
				Goal 2XL	2.40	pint
				Prowl H2O	4.00	pint
				Roundup WeatherMax	1.20	pint
Prune: Hand	Feb			Non-Machine Labor	30.00	hours
Prune: Chop Prunings	Mar	90 HP 4WD	Mower-Flail 8'	Equipment Operator Labor	0.23	hour
Weed Control - Disc 4X	Mar	90 HP 4WD	Disc - Tandem 8'	Equipment Operator Labor	0.38	hour
	Apr	90 HP 4WD	Disc - Tandem 8'	Equipment Operator Labor	0.38	hour
	June	90 HP 4WD	Disc - Tandem 8'	Equipment Operator Labor	0.38	hour
	Oct	90 HP 4WD	Disc - Tandem 8'	Equipment Operator Labor	0.38	hour
Winter Tie	Mar			Non-Machine Labor	5.00	hours
				Tying Materials	1.00	acre
Trunk Suckering	Apr			Non-Machine Labor	3.00	hours
Disease: Mildew (Dust)	Apr	30 HP 4WD	Duster - 3 Pt	Equipment Operator Labor	0.34	hour
	May	30 HP 4WD	Duster - 3 Pt	Dusting Sulfur	15.00	lb
				Dusting Sulfur	45.00	lb
	June	30 HP 4WD	Duster - 3 Pt	Dusting Sulfur	15.00	lb
	July	30 HP 4WD	Duster - 3 Pt	Dusting Sulfur	15.00	lb
Irrigate	Apr			Non-Machine Labor	0.50	hour
	May			Water Pumped	2.00	acin
				Non-Machine Labor	0.50	hour
	June			Water Pumped	2.50	acin
				Non-Machine Labor	1.00	hour
	July			Water Pumped	3.50	acin
				Non-Machine Labor	1.00	hour
	Aug			Water Pumped	3.50	acin
				Non-Machine Labor	1.00	hour
	Sept			Water Pumped	3.50	acin
Non-Machine Labor				0.50	hour	
Oct				Non-Machine Labor	1.50	acin
				Water Pumped	1.50	acin

Table 8. continued.

Operation	Operation Month	Tractor	Implement	Labor Type/ Material	Rate/ acre	Unit
Shoot Removal/Positioning	May			Non-Machine Labor	16.50	hours
Fertilize: 2X (5-0-12)	May			05-00-12	300.00	lb
	Oct			05-00-12	300.00	lb
Trim Vines	June	90 HP 4WD	VineTrimmer	Equipment Operator Labor	0.41	hour
	Sept	90 HP 4WD	VineTrimmer	Equipment Operator Labor	0.41	hour
Disease: Mildew. Insects: Leaf Hopper, VMB	June	90 HP 4WD	Vine Sprayer 400 G	Equipment Operator Labor	0.43	hour
				Rally	4.00	oz
				Provado 1.6 Flowable	4.00	floz
				Movento	8.00	floz
Weed: Summer Strip 40%Ac (Rely)	June	30 HP 4WD Tractor	Weed Sprayer 200 G	Equipment Operator Labor	0.52	hour
				Rely 200	1.50	pint
Disease: Mildew(Adament) Insect: Mite(Acramite)	July	90 HP 4WD	Vine Sprayer 400 G	Equipment Operator Labor	0.43	hour
				Adament 50WG	3.00	oz
				Acramite 50WS	16.00	oz
Pickup Truck Use	July		Pickup Truck 1/2 T	Equipment Operator Labor	1.04	hours
ATV Use	July		ATV 4WD	Equipment Operator Labor	1.04	hours
Machine Harvest Fruit	Sept			Machine Harvest	1.00	acre
Haul To Winery (Custom)	Sept			Haul to Crusher	10.00	ton
Assessments	Sept			Lodi Winegrape Commission	4,800.00	gval
				Sharpshooter	4,800.00	gval