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**UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION**

**2007**

**SAMPLE COSTS TO  
ESTABLISH AND PRODUCE  
TABLE GRAPES**

**CRIMSON SEEDLESS**



**SAN JOAQUIN VALLEY - SOUTH**

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## UC COOPERATIVE EXTENSION

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Crimson Seedless

San Joaquin Valley – South 2007

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### INTRODUCTION

Sample costs to establish and produce Crimson Seedless table grapes 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 considered typical for the crop and area, but these practices will not apply to every farming operation. 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 farm 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 can be downloaded at <http://coststudies.ucdavis.edu>, requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-1517 or obtained from the local county UC Cooperative Extension offices. Some archived studies are also available on the website.

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## ASSUMPTIONS

The assumptions refer to Tables 1 to 8 and pertain to sample costs to establish the vineyard and produce Crimson Seedless table grapes in the San Joaquin Valley. 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 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 consists of 120 contiguous acres. Crimson Seedless vineyard establishment and table grape production is on 40 acres. Other table grape varieties are on 75 acres; roads, irrigation systems, and farmstead occupy five acres. The farm is owned and managed by the grower.

### **Establishment Cultural Practices & Material Inputs** (Table 1)

**Site Preparation.** This vineyard is established on ground previously planted to vineyards or orchards. Land coming from vines or trees should be fallowed for two years except for a possible grain crop. The land is assumed to be fairly level. A custom operator chisels the ground (subsoils) twice to a depth of 4-5 feet. The grower floats the land to smooth and level the surface. Afterwards the ground is disced twice to apply and incorporate preplant herbicide. Nematode samples should be taken from land formerly in vines or trees and fumigated if necessary. Most operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year.

**Plant.** Planting the vineyard starts by laying out and marking vine sites in early spring. Holes are dug and vines planted and a two-inch by two-inch cardboard carton placed around the vine. In the second year, 2% or 10 vines per acre are replaced.

**Vines.** The Crimson Seedless plants are dormant, bench-grafted rootstock vines purchased from a commercial nursery. The grapevines are planted during the spring on a 7-foot x 12-foot spacing (vine x row) with 518 vines per acre. Vines are trained during the first and second years. The grapevines are expected to begin yielding fruit in the third year and then be productive for an additional 22 years.

**Trellis System.** A commercial company installs the trellis system in the second year. The trellis system will be removed when the vineyard is removed; therefore it is considered part of the vineyard and included in the establishment costs. Materials for the open gable trellis are as follows: (1) Stakes with V structure are placed every 24-feet down the row. Metal stakes (2 lbs/ft strength) are 8.5-foot long and placed in the ground 3-feet. The open gable is 72-inches wide from tip to tip. (2) End assemblies consist of 9.5-foot metal post (4 lb/ft) with a V that matches those within the row and with 10-inch helix anchor. (3) Eight wires, 12.5 gauge high tensile, are used for fruit and canopy support; three wires, 14 gauge high tensile, are used for movable catch wires and drip hose support. For growers planting and training vines in the first year with the intention to harvest in the second year, trellis installation should be completed in the first year and the cost shown accordingly.

**Train/Prune.** Vines are pruned to one two bud spur in the first dormant season (December to February, January in this study).

**Train.** The following spring (second year), a single shoot is selected and trained up the stake to form the permanent structure of the vine. Training consists of tying the shoot, removing lateral shoots from the base and tipping the shoot when it reaches desired head height. Most of the training costs occur during the second summer. The third summer is devoted to training missing vines or vines delayed in growth.

**Prune.** In the third year (January), vines are pruned much like an established vine. The exception being the number of canes retained: 2-3 canes on young vines and 5-8 canes on mature vines. Prunings are placed in the row middles and shredded. Selecting and tying canes to fruiting wires is required each year for the life of the vineyard. Suckers from vine trunks are removed in April, a practice that continues each year but diminishes as the vineyard matures. It should be noted that Crimson Seedless is often trained to quadrilateral cordons and spur pruned, but in this study, vines are head trained and cane pruned.

**Irrigate.** Water pumping costs plus labor constitute the irrigation cost. In this study, water is calculated to cost \$4.59 per acre-inch or \$55.08 per acre-foot. The pumping cost is based on a 40 horsepower (HP) motor to pump from 130 feet deep. The vineyard is irrigated during the growing season from April through October during the establishment years. Price per acre-foot of water will vary by grower in this region depending on quantity used, water district, power cost, various well characteristics, and other irrigation factors. The amount of water applied to the vineyard varies through the establishment years and is shown in Table A.

Year	AcIn/Year
1	8
2	18
3+	36

**Fertilize.** Liquid nitrogen fertilizer, UN32, is applied through the irrigation system in April of the first year at five pounds of N per acre. A single application is made in April of the second year. The amount of nitrogen applied each year increases as the vineyard matures and is shown in Table B. It is important to identify sources of nitrogen in order to properly manage the nitrogen budget. For example, sources of nitrogen such as irrigation well water should be calculated to determine future irrigation and fertilizer needs.

Year	Lbs of N
1	5
2	25
3+	50

**Pest Management.** For pest identification, monitoring, management and pesticide information, visit the UC IPM website at [www.imp.ucdavis.edu](http://www.imp.ucdavis.edu). Written recommendations are required for many commercially applied pesticides, and are available from licensed pest control advisers (PCAs). For information on pesticide use permits, contact the local county Agricultural Commissioner’s office. **Pesticides mentioned in this study are used to calculate rates and costs. Although the pesticides mentioned are commonly used by growers, many other pesticides are available. Check with your PCA and/or the UC IPM website for current recommendations.**

**Weeds (Vineyard Floor Management).** In October of the year prior to planting, Treflan is applied to the vineyard floor and incorporated by discing. After planting, weeds in the vine rows and middles are managed with discing, mowing, and/or herbicides. From March through July of the first year, the row middles are disced twice and mowed twice. The vine rows are hand weeded in April. The row middles are mowed three to four times during the growing season starting the second year. The vine rows are sprayed (strip spray) in January of the second year with Roundup and Surflan. The strip spray is applied to 30% of the acreage. Also in the second year, spot sprays using Roundup are applied to the vine row in April, June, and July. The spot sprays (weedy spots or areas) are applied using an all terrain vehicle (ATV) with a sprayer attached.

**Insects.** Beginning in the second year, western grapeleaf skeletonizer (*Harrisina brillians*) is controlled in April with an application of Kryocide insecticide (mixed with micronized sulfur sprays). Additionally insects such as mealybugs are monitored each year beginning in the spring and may increase production costs if found.

If mealybugs (*Pseudococcus sp.*) are found during vineyard establishment, the grower should consult with a PCA, farm advisor, and/or Ag commissioner to develop management strategies.

**Diseases.** Although many pathogens attack grapevines, phomopsis cane and leafspot (*Phomopsis viticola*) and powdery mildew (*Uncinula necator*) are the two diseases managed in this study. In April of the second and third years, Microthiol plus Abound (strobilurin) are applied for phomopsis and mildew control. Mildew is controlled with various fungicide applications at 7 to 21 day intervals in the third year, depending on the fungicide used. For this study, the grower applies Kocide (copper) and Rubigan (SI), and two Microthiol applications (one with Kryocide) in April; one Rubigan (SI) application and two dusting sulfur applications in May; one Rubigan (SI) application and two dusting sulfur applications in June. Growers have the option of using sulfur (dust, wettable, flowable or micronized), sterol inhibitors (SIs), or strobilurins, as well as other fungicides to control powdery mildew. Sterol inhibitors and strobilurins are two classes of fungicides with different modes of action than sulfur against powdery mildew. It is recommended that fungicides with different modes of action be used to avoid powdery mildew populations from developing fungicide resistance.

**Vertebrate.** Rabbits, gophers, squirrels and coyotes are pests that can cause damage to the vines and irrigation lines. Various forms of control such as baiting, trapping and/or building a rabbit fence are utilized as necessary throughout the year. For this study no specific control is used, but an estimated cost for one or two management practices are shown in March. **Endangered Species:** It is important to know if your vineyard is located in an area where endangered species reside (i.e. San Joaquin Kit Fox). Trapping and killing endangered species can result in fines. Contact your County Agricultural Commissioner for additional information.

**Harvest/Yield/Returns.** The table grapes in this study are first harvested in the third year and the yields are 50% to 75% of mature producing vines. An assumed yield of 600 nineteen pound boxes is used for calculating income. If the crop is harvested for wine, a labor contractor may be needed. Growers sometimes plant and train vines in the same year, which produces a harvestable Crimson Seedless table grape crop in the second year.

## **Mature Production Cultural Practices and Material Inputs** (Tables 2-8)

**Prune/Sucker/Canopy Management (CM).** The vines are cane-pruned during the winter months (December to early February) in January and the prunings are placed in the row middles and shredded. In mid February, the canes are tied by wrapping on the trellis wire and tying with twist-ties. Suckers are removed from the vine trunks in early April. Shoot positioning and removal are done in late April. The canes are mechanically cut in June to improve canopy microclimate, allowing for sunlight penetration and proper coverage of pesticides.

**Fruit Management (FM).** Gibberellic acid (GA), a plant growth regulator, is applied two times: one time in May for thinning during bloom at one gram per acre and a second time for berry sizing three to four weeks after full bloom (June) at eight grams per acre (disease and insect materials are included with these applications). Applying GA to Crimson Seedless for sizing increases berry weight less than 10%. GA applied at this time decreases fruit color. Tradeoffs should be considered before application. Vines are girdled to increase berry size two to three weeks after full bloom (June). Cluster tipping and hand thinning are done in late May to early June to loosen and adjust cluster length and crop load. Leaf removal for fruit exposure is done in June. Ethrel, a second plant growth regulator, is applied to the vineyard in August to enhance color development in the fruit. Some growers cover canopies late in the season with plastic to protect fruit from fall rains, but the value of the practice is open for debate.

**Trellis/Vines.** Trellis repairs are done annually (January in this study) and the cost is not taken from any specific data. Weak or missing vines are replaced by layering. One year-old canes from neighboring vines are buried (layered) in the soil next to the stake and allowed to root. After rooting the canes are cut and the plant trained on the trellis. Trellis repair and vine replacement increases with vineyard age.

**Irrigate.** The vineyard is drip irrigated during the growing season from April through October. Deficit irrigation (70% ET) is applied three to five weeks prior to harvest to slow shoot growth and promote fruit maturity. Deficit irrigation may not work well on weak or low vigor vineyards. If deficit irrigation is used, these vineyards should be monitored closely. Water pumping costs plus labor constitute the irrigation cost. In this study, water is calculated to cost \$ \$4.59 per acre-inch or \$ \$55.08 per acre-foot. The pumping cost is based on a 40 horsepower (HP) motor to pump from 130 feet depth and pressurized to 20 pounds per square inch (PSI). A total of 36 acre-inches is applied to the vineyard. Price per acre-foot of water will vary by grower in this region depending on quantity used, water district, power cost, various well characteristics, and other irrigation factors.

**Fertilize.** Nitrogen (N) at 50 pounds per acre as UN32 is applied through the irrigation drip system in April or post-harvest. Neutral zinc is applied to prevent zinc deficiencies and is combined with the late April mildew (Microthiol, Rally) application.

**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](http://www.ipm.ucdavis.edu). For information and pesticide use permits, contact the local county agricultural commissioner's office. **Pesticides mentioned in this study are used to calculate rates and costs. Although the pesticides mentioned are commonly used by growers, many other pesticides are available. Check with your PCA and/or the UC IPM website for current recommendations.** Adjuvants are recommended for use with many pesticides for effective control, but the adjuvants and their costs are not included in this study. Pesticide costs may vary by location, brand, and grower volume. Pesticide costs in this study are taken from a single dealer and shown as full retail.

*Pest Control Adviser (PCA).* Written recommendations are required for many commercially applied pesticides and are written by licensed pest control advisers. In addition the PCA will monitor the field for agronomic problems including pests, diseases, and nutritional status. Growers may hire private PCAs or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. Costs for a PCA are not included in this study.

*Weeds (Vineyard Floor Management).* Vineyard middles are mowed three times each season: March, May, July. Surflan and Roundup herbicides are applied to the vine row/berm in February. Roundup, a contact herbicide, is applied as a spot spray to the vine row in June.

*Insects.* Mealybug (*Pseudococcus sp.*) is treated with Lorsban insecticide in early March (dormant vines). Western grapeleaf skeletonizer (*Harrisina brillians*) is treated with Kryocide (mixed with a GA and/or sulfur application) during the bloom thinning spray in May. Grape leafhoppers (*Erythroneura elegantula*) are controlled with Provado insecticide (mixed with GA, Microthiol, Rally) during the berry size spray in June. An effective alternative material for mealybugs is to apply Admire insecticide through the drip system, but at a higher cost than a Lorsban application. It may be necessary to use multiple insecticides to control some mealybug species.

*Diseases.* Diseases treated in this study are phomopsis cane and leafspot (*Phomopsis viticola*) and powdery mildew (*Erysiphe necator*). Phomopsis and powdery mildew are both treated in late March (shoot

length averages 2-inches) with Abound and Microthiol (micronized sulfur). Mildew is controlled with various fungicide applications at 7 to 21 day intervals, depending on the fungicide used. In this study, Dusting Sulfur is applied three times – April, June, July. Microthiol and Rally, an SI, (with zinc) are applied in late April. Microthiol (with GA and Kryocide) is applied with the May bloom thin spray. Rally and Microthiol are applied in June. Microthiol and Rally (with GA and Provado) are applied with the berry size spray in June. Microthiol and Rally are applied in July. Dusting Sulfur is applied two times in September and two times in October to control powdery mildew on the stems. The mildew does not grow on the grapes at this stage of maturity. Vanguard fungicide is applied in October to protect grapes from Botrytis Bunch Rot. Growers have the option of using sulfur (dust, wettable, flowable or micronized), sterol inhibitors (SIs), or strobilurins, as well as other fungicides to control powdery mildew. Sterol inhibitors and strobilurins are two classes of fungicides with different modes of action than sulfur against powdery mildew. It is recommended that fungicides with different modes of action be used to prevent powdery mildew populations from acquiring fungicide resistance.

**Vertebrate.** Gophers, squirrels coyotes and birds are pests that can cause damage to the vines and irrigation lines. Various forms of control such as baiting, trapping and shooting are utilized as necessary throughout the year. For this study no specific control is used, but per acre costs are shown from March through October and are an estimate not based on any specific data. **Endangered Species:** It is important to know if your vineyard is located in an area where endangered species reside (i.e. San Joaquin Kit Fox). Trapping and killing endangered species can result in fines. Contact your County Agricultural Commissioner for additional information.

**Harvest.** Beginning in the October, the grapes are harvested for table grapes and packed in the field. The field is picked two to three times. Harvesting crews work in teams of three or four. Depending on fruit quality, the team can pick 3 to 6 boxes per hour per individual. For this study, the picker picks four shipping boxes per hour per individual. Two or three pickers field pick and trim the grapes, and put them in a reusable field box. After the fruit is picked and trimmed, the field boxes are loaded on a harvest wheelbarrow and delivered to the packer who places the fruit in bags and places them in shipping boxes. The box holds 9 bags and weighs 19 pounds when filled. The empty boxes are stacked along row ends and when filled, they are loaded on a truck and hauled to storage. The swap and haul cost includes the boxes, plastic bags and related labor. Pre cooling and palletization (P&P) costs may in some cases be a grower cost but are generally charged to the buyer. After 30 days of cold storage, the grower is charged approximately \$0.35 per box per month (\$0.25-0.45) until the fruit is sold. Brokerage fees are paid by the grower and range from 7 to 10% of the selling price. A figure of 9% of the selling price is used in this study.

**Yields.** This study uses an average yield of 1,000, 19-pound boxes over the productive life of the vineyard to calculate returns. Average yields for all table grape varieties are shown in Table C. The averages include all vineyards in production regardless of maturity.

**Returns.** Return prices for grapes at different yields and prices are shown in Table 5. Based on grower information, an estimated price of \$14 per box for Crimson Seedless grapes is used in this study.

Average Yields	
Year	Ton/Acre (boxes)
2002	8.13 (856)
2003	7.60 (800)
2004	7.76 (815)
2005	11.34 (1,194)
2006	9.66 (1,016)

Source: Fresno County Crop Reports, 2002-2006

Box = 19 lbs.

**Assessments/Inspection.** The California Table Grape Commission (CTGC) assesses \$0.1156 per 19-pound box or \$0.006087 per pound. Early in the season, growers often have the county Agricultural Commissioner inspect their fruit for maturity at a cost of \$0.035 per box. Approximately one-third of the entire crop is inspected to determine that maturity requirements are met, which includes soluble solids:acid ratios (20:1) and color.

**Pickup/ATV.** It is assumed that the grower uses the pickup for business and personal use. Estimated business mileage for the ranch is 5,250 miles. The all terrain vehicle (ATV) is used for spot spraying weeds and is included in that cost. It is assumed that the ATV will be used another 800 miles on the ranch for checking the vineyards including the irrigation system.

**Labor.** Hourly wages for workers are \$11.00 for machine operators and \$8.50 per hour non-machine labor. Adding 33% for the employer's share of federal and state payroll taxes, workers compensation insurance for vine crops (0040) and other possible benefits gives the labor rates shown of \$14.63 and \$11.31 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 the American Society of Agriculture 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 diesel and gasoline are \$2.30 and \$2.80 per gallon, respectively. Fuel costs are derived from American Automobile Association (AAA) and Energy Information Administration 2006 monthly data. The cost includes a 2.25% sales tax (effective September 2001) on diesel fuel and 7.25% sales tax on gasoline. Gasoline also includes federal and state excise tax, which can be refunded 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.

**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 10.00% 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 2007.

**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. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, sanitation services, equipment repairs, and management.

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



**Insurance.** Insurance for farm investments varies depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.714% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs \$ 674 for the entire farm.

**Office Expense.** Office and business expenses are estimated at \$80 per producing acre or \$9,200 annually for the ranch. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

**Sanitation Services.** Sanitation services provide double portable toilets with washbasins for 10 months. The cost includes delivery and weekly cleaning service. The number of sanitation facilities will vary depending upon local regulations and size of labor force. In many cases labor contractors furnish the sanitation facilities for their crews and are included in the contractor's labor overhead.

**Management/Supervisor Wages.** Salary is not included. Returns above costs are considered a return to management

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

### **Non-Cash Overhead Costs**

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

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

**Salvage Value.** Salvage value is an estimate of the remaining value of an investment at the end of its useful life. For farm machinery (tractors and implements) the remaining value is a percentage of the new cost of the investment (Boehlje and Eidman). The percent remaining value is calculated from equations developed by the American Society of Agricultural Engineers (ASAE) based on equipment type and years of life. The life in years is estimated by dividing the wear out life, as given by ASAE by the annual hours of use in this operation. For other investments including irrigation systems, buildings, and miscellaneous equipment, the value at the end of its useful life is zero. The salvage value for land is the purchase price because land does not depreciate. The purchase price and salvage value for equipment and investments are shown in Table 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 7.25% 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 2007.

**Land.** The land was formerly a vineyard, but has been out of production for two years. The open land was planted to grain crops. Land in the San Joaquin Valley with table grape production ranges from \$6,000 to \$13,400 per acre (depending on vineyard age, variety and location). Cropland with district or well water in the area ranges from \$2,500 to \$12,000. For this study, the land value was established based on 2007 real estate values (2007 Trends & Leases); therefore a cost of \$7,000 per acre or \$7,304 per producing acre is used.

**Tools.** This is an assumed value for shop, hand, and miscellaneous field tools and not based on any grower's tool inventory.

**Fuel Tanks.** Two 300-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.

**Drip Irrigation System.** The drip lines, filters, booster pump and the labor to install the components are included in the irrigation system cost. The previous vineyard is assumed to have a pumping system that had been refurbished and therefore is not included as a cost. Water is delivered from a 130-foot depth using a 40-horsepower pump. The drip irrigation lines are laid directly on the ground prior to planting and the labor cost is included in the drip irrigation system cost.

**Establishment Cost.** The 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 (third planted year in this study) that grapes are harvested. It is used to determine the non-cash overhead expense, (capital recovery cost) during the production years. The Total Accumulated Net Cash Cost on Table 1, in the third year represents the establishment costs. For this study the cost is \$5,247 per acre or \$209,880 for the 40 producing acres. The establishment cost is spread over the remaining 22 years of the 25 years the vineyard is in production.

**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 your local county UC Cooperative Extension office or UC DANR Communications Services online at <http://ucanr.org>.

UC COOPERATIVE EXTENSION  
**Table 1. COSTS PER ACRE TO ESTABLISH A CRIMSON TABLE GRAPE VINEYARD**  
 SAN JOAQUIN VALLEY SOUTH - 2007

	Cost Per Acre			
	Year:	1st	2nd	3rd
Boxes Per Acre:	0	0	600	
Planting Costs:				
<b>Site Prep:</b> Subsoil 2X	400			
<b>Site Prep:</b> Float (Level)	12			
<b>Site Prep:</b> Disc/Apply Herbicide (Treflan)	17			
<b>Site Prep:</b> Disc/Incorporate Herbicide	12			
<b>Plant:</b> Survey & Layout Vineyard	70			
<b>Plant:</b> Plant, Wrap Vines	166	2		
<b>Vines:</b> 518 Per Acre (2% Replant In 2nd Year)	1,606	31		
<b>Trellis:</b> Trellis System (custom)		4,000		
<b>TOTAL PLANTING COSTS</b>	<b>2,282</b>	<b>4,033</b>		
Cultural Costs:				
<b>Vertebrate:</b> (Rabbit, Gopher, Squirrel)	40	15	15	
<b>Fertilize:</b> Nitrogen (UN32)	3	12	23	
<b>Irrigate:</b> Water/Labor	54	107	181	
<b>Weed:</b> Disc Middles - 2X/Yr 1	16			
<b>Weed:</b> Mow Middles - 2X/Yr 1, 4X/Yr 2, 3X/Yr 3	16	31	24	
<b>Weed:</b> Hand Hoe	34			
<b>Prune:</b> Dormant		73	90	
<b>Training:</b> (Sucker, Tie)		271	136	
<b>Insect:</b> Skeletonizer (Kryocide). <b>Disease:</b> Mildew (Microthiol)		36	36	
<b>Weed:</b> Spot Spray (Roundup)		42	42	
<b>Weed:</b> Winter Strip Spray (Roundup, Surflan)		53	53	
<b>Prune:</b> Shred prunings			15	
<b>Disease:</b> Phomopsis (Microthiol, Abound)			51	
<b>Disease:</b> Mildew Control (Microthiol)			20	
<b>Insect:</b> Leafhoppers 1X (Provado)			46	
<b>Disease:</b> Mildew (Kocide, Rubigan)			50	
<b>Disease:</b> Mildew 4X (Sulfur Dust)			39	
<b>Disease:</b> Mildew 2X, (Rubigan)			56	
<b>Pickup:</b> Business use	82	82	82	
<b>ATV:</b> Field use	30	38	38	
<b>TOTAL CULTURAL COSTS</b>	<b>274</b>	<b>761</b>	<b>996</b>	
Harvest Costs:				
Pick & Field Pack (labor)				1,697
Spread/Stack boxes, Swamp, Haul (includes boxes, bags, labor)				1,372
Brokerage Fee				756
Assessment & Inspection Fees				77
<b>TOTAL HARVEST COSTS</b>				<b>3,901</b>
Interest On Operating Capital @ 10.00%	233	355	83	
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>2,788</b>	<b>5,148</b>	<b>4,980</b>	
Cash Overhead Costs:				
Office Expense	80	80	80	
Liability Insurance	6	6	6	
Sanitation Service	19	19	19	
Property Taxes	85	86	88	
Property Insurance	9	9	11	
Investment Repairs (non-cash overhead items)	42	42	42	
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>242</b>	<b>242</b>	<b>246</b>	
<b>TOTAL CASH COSTS/ACRE</b>	<b>3,030</b>	<b>5,390</b>	<b>5,227</b>	
<b>INCOME/ACRE FROM PRODUCTION</b>	<b>0</b>	<b>0</b>	<b>8,400</b>	
<b>NET CASH COSTS/ACRE FOR THE YEAR</b>	<b>3,030</b>	<b>5,390</b>	<b>0</b>	
<b>PROFIT/ACRE ABOVE CASH COSTS</b>	<b>0</b>	<b>0</b>	<b>3,173</b>	
<b>ACCUMULATED NET CASH COSTS/ACRE</b>	<b>3,030</b>	<b>8,420</b>	<b>5,247</b>	

## UC COOPERATIVE EXTENSION

Table 1. continued

	Cost Per Acre			
	Year:	1st	2nd	3rd
	Boxes Per Acre:	0	0	600
Non-Cash Overhead Costs (Capital Recovery):				
Land		530	530	530
Irrigation System		110	110	110
Shop Building		57	57	57
Shop Tools		14	14	14
Fuel Tank & Pump		2	2	2
Equipment		37	41	95
<b>TOTAL CAPITAL RECOVERY COST</b>		750	755	809
<b>TOTAL COST/ACRE FOR THE YEAR</b>		3,780	6,145	6,035
<b>INCOME/ACRE FROM PRODUCTION</b>		0	0	8,400
<b>TOTAL NET COST/ACRE FOR THE YEAR</b>		3,780	6,145	0
<b>NET PROFIT/ACRE ABOVE TOTAL COST</b>		0	0	2,365
<b>TOTAL ACCUMULATED NET COST/ACRE</b>		3,780	9,925	7,560

UC COOPERATIVE EXTENSION  
**Table 2. COSTS PER ACRE TO PRODUCE CRIMSON TABLE GRAPES**  
 SAN JOAQUIN VALLEY - 2007

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre				Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
<b>Cultural:</b>							
<b>Vine:</b> Layering Missing Vines	1.00	11	0	0	0	11	
<b>Prune:</b> Vines	38.00	430	0	0	0	430	
<b>Prune:</b> Shred Prunings (Every Middle)	0.50	9	7	0	0	15	
<b>Trellis:</b> Repair	2.00	23	0	10	0	33	
<b>*CM:</b> Tie Canes	8.00	90	0	14	0	104	
<b>Weed:</b> Winter Strip (Surflan, Roundup)	0.49	9	5	40	0	53	
<b>Vertebrate:</b> (gopher, squirrel, coyote, bird) various methods	0.00	0	0	15	0	15	
<b>Disease:</b> Phomopsis (Abound)/Mildew (Microthiol)	0.50	9	7	35	0	51	
<b>Insect:</b> Mealybug (Lorsban)	0.50	9	7	25	0	41	
<b>Weed:</b> Mow Middles 3X	0.74	13	11	0	0	24	
<b>Disease:</b> Mildew 3X (Dusting Sulfur)	0.84	15	9	6	0	30	
<b>Sucker:</b> Remove Trunk Suckers	2.00	23	0	0	0	23	
<b>Disease:</b> Mildew (Rally, Microthiol). <b>Fertilize:</b> (Neutral Zinc)	0.50	9	7	28	0	44	
<b>Fertilize:</b> N through drip (UN32)	0.00	0	0	23	0	23	
<b>Irrigate:</b> (Water)	2.55	29	0	165	0	194	
<b>CM:</b> Shoot Position & Removal	15.00	170	0	0	0	170	
<b>FM:</b> BloomThin (GA). <b>Disease:</b> Mildew (Microthiol). <b>Insect:</b> Skeletonizer (Kryocide)	0.50	9	7	22	0	37	
<b>FM:</b> Fruit Exposure/Leaf Removal	50.00	566	0	0	0	566	
<b>Disease:</b> Mildew (Rally, Sulfur)	0.50	9	7	23	0	38	
<b>FM:</b> Cluster Thinning	10.00	113	0	0	0	113	
<b>FM:</b> Girdle	12.00	136	0	0	0	136	
<b>FM:</b> Berry Size (GA). <b>Disease:</b> Mildew (Microthiol, Rally). <b>Insect:</b> Leafhopper (Provado)	0.50	9	7	80	0	96	
<b>CM:</b> Cane Cutting (Mechanical)	0.29	5	3	0	0	8	
<b>Weed:</b> Spot Spray (Roundup)	0.53	9	1	4	0	14	
<b>Disease:</b> Mildew (Rally, Microthiol)	0.50	9	7	23	0	38	
<b>FM:</b> Color Fruit (Ethrel)	0.50	9	7	8	0	24	
<b>Disease:</b> Mildew on Stem 4X (Dusting Sulfur)	1.12	20	12	9	0	40	
<b>Disease:</b> Botrytis (Vanguard)	0.50	9	7	47	0	62	
Pickup Truck Use	2.39	42	40	0	0	82	
ATV	2.00	35	3	0	0	38	
<b>TOTAL CULTURAL COSTS</b>	153.95	1,825	151	576	0	2,552	
<b>TOTAL CULTURAL COSTS/Box</b>		1.82	0.15	0.58	0.00	2.55	
<b>Harvest (1,000 boxes per acre):</b>							
Pick and Field Pack	250.00	2,828	0	0	0	2,828	
Boxes, Spread/Stack, Swamp & Haul (includes boxes, bags)	2.00	363	16	1,915	0	2,294	
Brokerage Fee	0.00	0	0	0	1,260	1,260	
Assessment & Inspection Fees	0.00	0	0	128	0	128	
<b>TOTAL HARVEST COSTS/ACRE</b>	252.00	3,191	16	2,043	1,260	6,509	
<b>TOTAL HARVEST COSTS/Box</b>		3.19	0.02	2.04	1.26	6.51	
Interest on operating capital @ 10.00%						187	
<b>TOTAL OPERATING COSTS/ACRE</b>		5,015	167	2,618	1,260	9,248	
<b>TOTAL OPERATING COSTS/Box</b>		5.02	0.17	2.62	1.26	9.25	
<b>CASH OVERHEAD:</b>							
Office Expense						80	
Liability Insurance						6	
Sanitation Fees						19	
Property Taxes						116	
Property Insurance						31	
Investment Repairs						42	
<b>TOTAL CASH OVERHEAD COSTS</b>						294	
<b>TOTAL CASH COSTS/ACRE</b>						9,542	

UC COOPERATIVE EXTENSION

Table 2. continued

Operation	Operation Time (Hrs/A)	Cash and Labor Cost per acre				Total Cost	Your Cost
		Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent		
NON-CASH OVERHEAD ( Capital Recovery):		Per producing Acre	-- Annual Cost -- Capital Recovery				
Land		7,304		530		530	
Drip Irrigation System		1,250		110		110	
Building		696		57		57	
Tools-Shop/Field		130		14		14	
Fuel Tanks 2-300G		30		2		2	
Vineyard Establishment Equipment		5,247 968		484 129		484 129	
TOTAL NON-CASH OVERHEAD COSTS		15,626		1,326		1,326	
TOTAL COSTS/ACRE						10,868	
TOTAL COSTS/Box						10.87	

\*CM = Canopy Management. FM = Fruit Management

To find cost per box divide by 1,000

UC COOPERATIVE EXTENSION  
**Table 3. MATERIAL & CUSTOM COSTS & NET RETURN PER ACRE FOR CRIMSON TABLE GRAPES**  
 SAN JOAQUIN VALLEY - SOUTH 2007

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>GROSS RETURNS</b>					
Crimson Table Grapes (19 lb box)	1,000.00	box	14.00	14,000	
<b>OPERATING COSTS</b>					
<b>Trellis System:</b>					
Miscellaneous Repair Materials	1.00	acre	10.00	10	
<b>Vine Aids:</b>					
Tying Materials (twist-ems) (\$0.003 each)	4,540.00	each	0.00	14	
<b>Herbicide:</b>					
Surflan 4 AS	2.40	pint	14.52	35	
Roundup Ultra Max	1.10	pint	7.80	9	
<b>Vertebrate Control:</b>					
Shoot, Bait, Trap	1.00	acre	15.00	15	
<b>Fungicide:</b>					
Abound (Strobilurin)	12.00	floz	2.86	34	
Microthiol Disperss (micronized wettable sulfur)	11.00	lb	0.83	9	
Dusting Sulfur	70.00	lb	0.22	15	
Rally 40W (Sterol Inhibitor)	16.00	oz	5.23	84	
Vanguard WG	10.00	oz	4.66	47	
<b>Insecticide:</b>					
Lorsban 4E	4.00	pint	6.35	25	
Kryocide	6.00	lb	3.08	18	
Provado 1.6 Solupak	1.00	oz	44.21	44	
<b>Fertilizer:</b>					
Neutral Zinc 50% (foliar)	5.00	lb	1.08	5	
UN 32	50.00	lb N	0.46	23	
<b>Water:</b>					
Water Pumped	36.00	acin	4.59	165	
<b>Growth Regulator:</b>					
ProGibb 4% (Gibberelic Acid)	9.00	gram	1.68	15	
Ethrel	1.00	pint	8.04	8	
<b>Harvest Supplies:</b>					
Box (19 lb)	1,000.00	box	1.60	1,600	
Plastic Bags (9/box)	9,000.00	each	0.04	315	
<b>Contract:</b>					
Commission (9% of selling price)	1,000.00	box	1.26	1,260	
<b>Assessment:</b>					
Table Grape Commission	1,000.00	box	0.12	116	
Quality Inspection (1/3 of yield)	333.00	box	0.04	12	
Labor (machine)	18.48	hrs	14.63	270	
Labor (non-machine)	419.55	hrs	11.31	4,745	
Fuel - Gas	11.78	gal	2.80	33	
Fuel - Diesel	29.50	gal	2.30	68	
Lube				15	
Machinery repair				51	
Interest on operating capital @ 10.00%				187	
<b>TOTAL OPERATING COSTS/ACRE</b>				9,248	
<b>NET RETURNS ABOVE OPERATING COSTS</b>				4,752	
<b>CASH OVERHEAD COSTS:</b>					
Office Expense				80	
Liability Insurance				6	
Sanitation				19	
Property Taxes				116	
Property Insurance				31	
Investment Repairs				42	
<b>TOTAL CASH OVERHEAD COSTS/ACRE</b>				294	
<b>TOTAL CASH COSTS/ACRE</b>				9,542	



UC COOPERATIVE EXTENSION

**Table 3. continued**

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
<b>NON-CASH OVERHEAD COSTS (Capital Recovery)</b>					
Land				530	
Drip Irrigation System				110	
Building				57	
Tools-Shop/Field				14	
Fuel Tanks 2-300G				2	
Establishment Costs				484	
Equipment				129	
<b>TOTAL NON-CASH OVERHEAD COSTS/ACRE</b>				<b>1,326</b>	
<b>TOTAL COSTS/ACRE</b>				<b>10,868</b>	
<b>NET RETURNS ABOVE TOTAL COSTS</b>				<b>3,132</b>	

UC COOPERATIVE EXTENSION  
**Table 4. MONTHLY CASH COSTS PER ACRE to PRODUCE CRIMSON TABLE GRAPES**  
 SAN JOAQUIN VALLEY – SOUTH 2007

Beginning JAN 07	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 07	07	07	07	07	07	07	07	07	07	07	07	07	
Cultural: <b>Bold</b> see section in assumptions													
<b>Vine:</b> Layering Missing Vines	11												11
<b>Prune:</b> Vines	430												430
<b>Prune:</b> Shred Prunings (all middles)	15												9
<b>Trellis:</b> Repair	33												33
<b>*CM:</b> Tie Canes		104											104
<b>Weed:</b> Winter Strip (Surflan, Roundup)		53											53
<b>Vertebrate:</b> (gophers, squirrels, coyotes, birds)			2	2	2	2	2	2	2	2			15
<b>Disease:</b> Phomopsis (Abound)/Mildew (Microthiol)			51										51
<b>Insect:</b> Mealybug (Lorsban)			41										41
<b>Weed:</b> Mow Middles 3X			8		8		8						24
<b>Disease:</b> Mildew (Dusting Sulfur)				10		10	10						30
<b>Sucker:</b> Trunk				23									23
<b>Disease:</b> Mildew (Microthiol, Rally). <b>Fertilize:</b> (Zn)				44									44
<b>Fertilize:</b> (UN32) through drip				23									23
<b>Irrigate:</b> (Water/Labor)				6	22	37	48	44	31	6			194
<b>*CM:</b> Shoot Position & Removal				170									170
<b>*FM:</b> BloomThin (GA). <b>Disease:</b> Mildew (Microthiol). <b>Insect:</b> Skeletonizer (Kryocide)					37								37
<b>FM:</b> Fruit Exposure/Leaf Removal						566							566
<b>Disease:</b> Mildew (Rally, Microthiol)						38							38
<b>FM:</b> Cluster Thinning						113							113
<b>FM:</b> Girdle						136							136
<b>FM:</b> Berry Sizing (GA). <b>Disease:</b> Mildew (Microthiol, Rally). <b>Insect:</b> Leafhopper (Provado)						96							96
<b>CM:</b> Cane Cutting (Mechanical)						8							8
<b>Weed:</b> Spot Spray (Roundup)						14							14
<b>Disease:</b> Mildew (Rally, Microthiol)							38						38
<b>FM:</b> Color Fruit (Ethrel)								24					24
<b>Disease:</b> Mildew on stem 4X (Dusting Sulfur)									20	20			40
<b>Disease:</b> Botrytis (Vanguard)										62			62
<b>Pickup</b> Truck Use	7	7	7	7	7	7	7	7	7	7	7	7	82
<b>ATV</b>	3	3	3	3	3	3	3	3	3	3	3	3	38
<b>TOTAL CULTURAL COSTS</b>	499	167	111	287	79	1,030	116	79	63	100	10	10	2,552
Harvest:													
Pick & Field Pack										2,828			2,828
Boxes, Spread, Swamp & Haul										2,294			2,294
Brokerage Fee										1,260			1,260
Assessment & Inspection Fees										128			128
<b>**TOTAL HARVEST COSTS</b>										6,509			6,509
Interest on operating capital @ 10.00%	4	6	6	9	10	18	19	20	20	75	0	0	187
<b>TOTAL OPERATING COSTS/ACRE</b>	503	173	118	296	88	1,048	135	99	83	6,685	10	10	9,248

UC COOPERATIVE EXTENSION

Table 4. continued

Beginning JAN 07 Ending DEC 07	JAN 07	FEB 07	MAR 07	APR 07	MAY 07	JUN 07	JUL 07	AUG 07	SEP 07	OCT 07	NOV 07	DEC 07	TOTAL
CASH OVERHEAD:													
Office Expense	7	7	7	7	7	7	7	7	7	7	7	7	80
Liability Insurance									6				6
Sanitation Fees	2	2	2	2	2	2	2	2	2	2			19
Property Taxes	58						58						116
Property Insurance	15						15						31
Investment Repairs	4	4	4	4	4	4	4	4	4	4	4	4	42
<b>TOTAL CASH OVERHEAD COSTS</b>	<b>86</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>12</b>	<b>86</b>	<b>12</b>	<b>18</b>	<b>12</b>	<b>10</b>	<b>10</b>	<b>294</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>589</b>	<b>185</b>	<b>130</b>	<b>308</b>	<b>101</b>	<b>1,060</b>	<b>221</b>	<b>111</b>	<b>101</b>	<b>6,697</b>	<b>20</b>	<b>20</b>	<b>9,542</b>

\*CM = Canopy Management. FM = Fruit Management

\*\* To find cost per box divide by 1,000

UC COOPERATIVE EXTENSION  
**Table 5. RANGING ANALYSIS**  
 SAN JOAQUIN VALLEY – SOUTH 2007

COSTS PER ACRE AT VARYING YIELD TO PRODUCE CRIMSON TABLE GRAPES

	YIELD (19 lb box/acre)						
	600	700	800	900	1,000	1,100	1,200
<b>OPERATING COSTS:</b>							
Cultural Cost	2,552	2,552	2,552	2,552	2,552	2,552	2,552
Harvest Cost (pick, pack, haul)	3,073	3,585	4,097	4,609	5,121	5,634	6,146
Brokerage Fee	756	882	1008	1134	1260	1386	1512
Assessment/Inspection Cost	77	89	102	115	128	140	153
Interest on operating capital	165	171	176	181	187	192	198
<b>TOTAL OPERATING COSTS/ACRE</b>	<b>6,623</b>	<b>7,279</b>	<b>7,935</b>	<b>8,591</b>	<b>9,248</b>	<b>9,904</b>	<b>10,561</b>
Total Operating Costs/box	11.04	10.40	9.92	9.55	9.25	9.00	8.80
<b>CASH OVERHEAD COSTS/ACRE</b>	<b>293</b>	<b>293</b>	<b>294</b>	<b>294</b>	<b>294</b>	<b>294</b>	<b>295</b>
<b>TOTAL CASH COSTS/ACRE</b>	<b>6,916</b>	<b>7,572</b>	<b>8,229</b>	<b>8,885</b>	<b>9,542</b>	<b>10,198</b>	<b>10,856</b>
Total Cash Costs/box	11.53	10.82	10.29	9.87	9.54	9.27	9.05
<b>NON-CASH OVERHEAD COSTS/ACRE</b>	<b>1,315</b>	<b>1,318</b>	<b>1,321</b>	<b>1,324</b>	<b>1,326</b>	<b>1,329</b>	<b>1,331</b>
<b>TOTAL COSTS/ACRE</b>	<b>8,231</b>	<b>8,890</b>	<b>9,550</b>	<b>10,209</b>	<b>10,868</b>	<b>11,527</b>	<b>12,187</b>
Total Costs/box	13.72	12.70	11.94	11.34	10.87	10.48	10.16

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/box	YIELD (19 lb box/acre)						
	600	700	800	900	1,000	1,100	1,200
10.00	-623	-279	65	409	752	1,096	1,439
11.00	-23	421	865	1,309	1,752	2,196	2,639
12.00	577	1,121	1,665	2,209	2,752	3,296	3,839
13.00	1,177	1,821	2,465	3,109	3,752	4,396	5,039
14.00	1,777	2,521	3,265	4,009	4,752	5,496	6,239
15.00	2,377	3,221	4,065	4,909	5,752	6,596	7,439
16.00	2,977	3,921	4,865	5,809	6,752	7,696	8,639

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE \$/box	YIELD (19 lb box/acre)						
	600	700	800	900	1,000	1,100	1,200
10.00	-916	-572	-229	115	458	802	1,144
11.00	-316	128	571	1,015	1,458	1,902	2,344
12.00	284	828	1,371	1,915	2,458	3,002	3,544
13.00	884	1,528	2,171	2,815	3,458	4,102	4,744
14.00	1,484	2,228	2,971	3,715	4,458	5,202	5,944
15.00	2,084	2,928	3,771	4,615	5,458	6,302	7,144
16.00	2,684	3,628	4,571	5,515	6,458	7,402	8,344

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE \$/box	YIELD (19 lb box/acre)						
	600	700	800	900	1,000	1,100	1,200
10.00	-2,231	-1,890	-1,550	-1,209	-868	-527	-187
11.00	-1,631	-1,190	-750	-309	132	573	1,013
12.00	-1,031	-490	50	591	1,132	1,673	2,213
13.00	-431	210	850	1,491	2,132	2,773	3,413
14.00	169	910	1,650	2,391	3,132	3,873	4,613
15.00	769	1,610	2,450	3,291	4,132	4,973	5,813
16.00	1,369	2,310	3,250	4,191	5,132	6,073	7,013

UC COOPERATIVE EXTENSION  
**Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, & BUSINESS OVERHEAD**  
 SAN JOAQUIN VALLEY – SOUTH 2007

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead		Total
						Insur- ance	Taxes	
07	60 HP 4WD Narrow Tractor	47,000	15	9,150	4,885	200	281	5,366
07	ATV 4WD	6,700	5	3,003	1,125	35	49	1,209
07	Brush Shredder 6'	8,000	15	768	862	31	44	937
07	Cane Cutter	3,500	20	182	333	13	18	364
07	Duster - 3 Pt 12'	5,500	5	1,792	1,040	26	36	1,103
07	Mower-Flail 8'	10,500	15	1,008	1,132	41	58	1,230
07	Orchard/Vine Sprayer 500 gal	21,000	5	6,840	3,973	99	139	4,211
07	Pickup Truck 1/2 T	28,000	7	10,621	4,023	138	193	4,354
07	Sprayer ATV 20 gal	350	10	62	46	1	2	50
07	Truck-Flatbed (10 ton)	56,000	10	16,542	6,882	259	363	7,504
07	Weed Sprayer 3 PT 100 gal	4,000	10	707	526	17	24	566
TOTAL		190,550		50,675	24,827	861	1,206	26,894
60% of New Cost *		114,330		30,405	14,896	517	724	16,136

\* 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	80,000	30		6,610	286	400	1,600	8,895
Drip Irrigation System 40 acres	50,000	25		4,388	179	250	1,000	5,816
Vineyard Establishment	209,880	22		19,369	749	1,049	0	21,168
Fuel Tanks 2-300 gal	3,500	30	350	286	14	19	70	389
Land	840,000	25	840,000	60,900	0	8,400	0	69,300
Tools-Shop/Field	15,000	15	1,500	1,614	59	83	300	2,056
TOTAL INVESTMENT	1,198,380		841,850	93,167	1,286	10,201	2,970	107,624

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/		Price/ Unit	Total Cost
	Farm	Unit		
Liability Insurance	115	acre	5.86	674
Office Expense	115	acre	80.00	9,200
Sanitation Fee	115	acre	19.35	2,225

UC COOPERATIVE EXTENSION  
**Table 7. HOURLY EQUIPMENT COSTS**  
 SAN JOAQUIN VALLEY - 2007

Yr	Description	COSTS PER HOUR							Total Costs/Hr.
		Actual Hours Used	Cash Overhead			Operating			
			Capital Recovery	Insur- ance	Taxes	Repairs	Fuel & Lube	Total Opera.	
07	60 HP 4WD Narrow Tractor	1,066	2.75	0.11	0.16	1.11	7.79	8.90	11.92
07	ATV 4WD	400	1.69	0.05	0.07	0.49	1.07	1.56	3.37
07	Brush Shredder 6'	134	3.88	0.14	0.20	3.49	0.00	3.49	7.71
07	Cane Cutter	100	1.99	0.08	0.11	1.29	0.00	1.29	3.47
07	Duster - 3 Pt 12'	240	2.60	0.07	0.09	0.79	0.00	0.79	3.55
07	Mower-Flail 8'	133	5.12	0.19	0.26	4.58	0.00	4.58	10.15
07	Orchard/Vine Sprayer 500 gal	400	5.96	0.15	0.21	3.67	0.00	3.67	9.99
07	Pickup Truck 1/2 T	286	8.46	0.29	0.41	2.04	14.76	16.80	25.96
07	Sprayer ATV 20 gal	148	0.19	0.01	0.01	0.09	0.00	0.09	0.30
07	Truck – Flatbed (10 ton)	200	20.65	0.78	1.09	5.30	2.64	7.94	30.46
07	Weed Sprayer 3 PT 100 gal	199	1.59	0.05	0.07	0.68	0.00	0.68	2.39

UC COOPERATIVE EXTENSION  
**Table 8. OPERATIONS WITH EQUIPMENT – CRIMSON TABLE GRAPES**  
 SAN JOAQUIN VALLEY 2007

Operation	Operation Month	Tractor	Implement	Material	Broadcast Rate/acre	Unit
<b>Weed:</b> Winter Strip (Surflan, Roundup)	February	60HP 4WD	Weed Sprayer	Surflan	2.40	pt
				Roundup	.60	pt
<b>Weed:</b> Mow Middles 4X	March	60HP 4WD	Mower Flail 8'			
	May	60HP 4WD	Mower Flail 8'			
	July	60HP 4WD	Mower Flail 8'			
<b>Weed:</b> Spot Spray (Roundup)	June	ATV 4WD	Weed Sprayer	Roundup	0.50	pt
<b>Irrigation:</b> (Water)	April			Water	1.00	acin
	May			Water	4.00	acin
	June			Water	7.00	acin
	July			Water	9.00	acin
	August			Water	8.00	acin
	September			Water	6.00	acin
<b>Irrigation:</b> Post Harvest	October			Water	1.00	acin
<b>Fertilize:</b> N through Drip (UN32)	April			UN 32	50.00	lb N
<b>Disease:</b> Mildew/Fertilize: Zn	April	60HP 4WD	Air Blast Sprayer	Microthiol (mildew)	2.00	lb
				Rally (mildew)	4.00	oz
				Neutral Zinc	5.00	lb
<b>Disease:</b> Phomopsis/Mildew	March	60HP 4WD	Air Blast Sprayer	About (phom/mildew)	12.00	floz
				Microthiol(phom/mildew)	1.00	lb
<b>Vertebrate:</b> (gopher, squirrel, coyote, and/or birds)	Mar - Oct			Various as needed	15.00	acre
<b>Disease:</b> Mildew 3X (Dusting Sulfur)	April	60HP 4WD	Duster	Dusting Sulfur	10.00	lb
	June	60HP 4WD	Duster	Dusting Sulfur	10.00	lb
	July	60HP 4WD	Duster	Dusting Sulfur	10.00	lb
<b>*FM:</b> Bloom Thin. <b>Disease:</b> Mildew. <b>Insect:</b> Skeletonizer	May	60HP 4WD	Air Blast Sprayer	GA(thin)	1.00	floz
				Microthiol (mildew)	2.00	lb
				Kryocide (skeletonizer)	6.00	lb
<b>Disease:</b> Mildew (Rally, Sulfur)	June	60HP 4WD	Air Blast Sprayer	Rally (mildew)	4.00	oz
				Microthiol (mildew)	2.00	lb
	July	60HP 4WD	Air Blast Sprayer	Rally (mildew)	4.00	oz
				Microthiol (mildew)	2.00	lb
<b>Disease:</b> Mildew on Stem 4X (Dusting Sulfur)	September	60HP 4WD	Duster	Dusting Sulfur	10.00	lb
	September	60HP 4WD	Duster	Dusting Sulfur	10.00	lb
	October	60HP 4WD	Duster	Dusting Sulfur	10.00	lb
	October	60HP 4WD	Duster	Dusting Sulfur	10.00	lb
<b>Disease:</b> Botrytis (Vanguard)	October	60HP 4WD	Duster	Vanguard	10.00	oz
<b>FM:</b> Berry Size/Disease: Mildew/ Insect: Leafhopper	June	60HP 4WD	Air Blast Sprayer	GA (size)	8.00	floz
				Microthiol (Mildew)	2.00	lb
				Rally (Mildew)	4.00	oz
				Provado (Leafhopper)	1.00	oz
<b>Insect:</b> Mealybug	March	60HP 4WD	Air Blast Sprayer	Lorsban	4.00	pt
<b>Trellis:</b> Repair	January			Labor	2.00	hrs
				Trellis Materials	10.00	acre
<b>Vine:</b> Layering Vines	January			Labor	1.00	hrs
<b>Prune</b>	January			Labor	38.00	hrs
<b>Prune:</b> Shred prunings	January	60HP 4WD	Brush Shredder			
<b>CM;</b> Tie Canes	February			Labor	8.00	hrs
				Materials	11.50	acre
<b>CM:</b> Shoot Positioning & Removal	April			Labor	15.00	hrs
<b>Sucker:</b> Remove Trunk Suckers	April			Labor	2.00	hrs
<b>CM:</b> Cane Cutting	June	60HP 4WD	Cane Cutter			
<b>FM:</b> Cluster Thinning	June			Labor	10.00	hrs
<b>FM:</b> Girdle	June			Labor	12.00	hrs
<b>FM:</b> Fruit Exposure/Leaf Removal	June			Labor	50.00	hrs
<b>FM:</b> Color Fruit	Aug	60HP 4WD	Air Blast Sprayer	Ethrel	1.00	pint
<b>Pickup:</b> Farm Use	Annual	Pickup 1/2 ton				
<b>ATV:</b> Farm Use	Annual	ATV				
<b>Harvest:</b> Pick & Pack	October			Labor	250.00	hrs
<b>Harvest:</b> Swamp, Spread, Haul	October	Truck-Flatbed		Labor	29.00	hrs

\* CM = Canopy Management. FM = Fruit Management