
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2007

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

REDGLOBE



SAN JOAQUIN VALLEY - SOUTH

Jennifer M. Hashim-Buckey UCCE Farm Advisor, Kern County
William L. Peacock UCCE Farm Advisor, Tulare County
Stephen J. Vasquez UCCE Farm Advisor, Fresno County
Karen M. Klonsky UCCE Specialist, Department of Agricultural and Resource Economics, UC
Davis
Richard L. De Moura Research Associate, Department of Agricultural and Resource Economics, UC
Davis

UC COOPERATIVE EXTENSION

SAMPLE COSTS TO ESTABLISH AND PRODUCE TABLE GRAPES

Redglobe

San Joaquin Valley South - 2007

CONTENTS

INTRODUCTION	2
ASSUMPTIONS	3
Establishment Cultural Practices & Material Inputs	3
Mature Production Cultural Practices & Material Inputs	5
Cash Overhead Costs	8
Non-Cash Overhead Costs	9
REFERENCES	11
Table 1. COSTS PER ACRE TO ESTABLISH A TABLE GRAPE VINEYARD	12
Table 2. COSTS PER ACRE TO PRODUCE TABLE GRAPES - Redglobe	14
Table 3. MATERIAL & CUSTOM COSTS & NET RETURNS PER ACRE FOR TABLE GRAPES	16
Table 4. MONTHLY CASH COSTS PER ACRE- TABLE GRAPES - Redglobe	18
Table 5. RANGING ANALYSIS	19
Table 6. WHOLE FARM EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS	20
Table 7. HOURLY EQUIPMENT COSTS	20
Table 8. OPERATIONS WITH EQUIPMENT & MATERIALS	21

INTRODUCTION

Sample costs to establish and produce Redglobe 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 based on production practices considered typical for the crop and area, but these same 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 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.

The University of California is an affirmative action/equal opportunity employer
The University of California and the United States Department of Agriculture, Risk Management Agency, cooperating.

ASSUMPTIONS

The assumptions refer to Tables 1 to 8 and pertain to sample costs to establish the vineyard and produce Redglobe table grapes in the San Joaquin Valley. The cultural practices described represent production operations and materials considered typical of 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. Redglobe table grape vineyard establishment and production are on 40 acres. Other table grape varieties are on 75 acres and 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 Redglobe plants are dormant, bench-grafted rootstock vines purchased from a commercial nursery. The grapevines are planted during the first 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 to quadrilateral cordons. The grapevines will 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-feet 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 cordon 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 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 cordon 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 is that in the third year the cordons are essentially canes; therefore, short spurs or no spurs are left at node positions. With mature vines 6 two bud spurs are retained on each of the four cordons. 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.

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. 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 a Kocide (copper) and Rubigan (SI) combination, 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. Growers sometimes plant and train vines in the same year, which produces a harvestable RedGlobe table grape crop in the second year. Yields in the third year are approximately 50 to 75% of mature production. If the crop in the third year is harvested for wine, a labor contractor may be needed. For this study, 500 boxes (19 pounds per box) of table grapes are assumed in the third year.

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

Prune/Sucker/Canopy Management (CM). The quad-cordon trained vines are spur-pruned during the winter months (January) and the prunings are placed in the row middles and shredded. Suckers and sterile shoots are removed from the vine trunks and crowns during April. Shoot thinning, shoot positioning and basil leaf removal are done by hand in April. Mechanical cane cutting (canopy skirting) is done in June with the grower's equipment.

Fruit Management (FM). Girdling of the trunk or bases of individual canes (trunk in this study) to increase berry size is done by hand in June. Cluster tipping and hand thinning are done in late May to early June after girdling to adjust berry set, cluster length, and crop load. Girdling is not recommended in weak vineyards and should be closely supervised to avoid deep cuts into the xylem.

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 which is usually not an issue until the vineyard is over 10 years old. One year-old canes from neighboring vines are buried (layered) in the soil next to the stake. These vines are trained the following spring. The layer is severed after 3 to 4 years when the new vine is fully established. 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 may also be applied three to four weeks before harvest to advance maturity and decrease decay. Deficit irrigation may not work well on weak or low vigor vineyards. 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 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. 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. 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 PCA's 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. Mealybugs (*Pseudococcus sp.*) are treated with Lorsban insecticide in early March (dormant vines). Western grapeleaf skeletonizer (*Harrisina brillians*) is treated with Kryocide (mixed with Microthiol) during the second disease spray (bloom) in May. Leafhoppers are controlled with Provado insecticide (mixed with Microthiol, Rally) during the second disease 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 and powdery mildew. Phomopsis and powdery mildew are both treated in late March (shoots average 2-inches) with Abound and Microthiol (micronized sulfur). Mildew is controlled during the season with various fungicide applications at 7 to 21 day intervals, depending on the fungicide used. In this study, sulfur dust is applied three times - April, June, July. Microthiol and Rally (with zinc fertilizer) are applied in late April. Microthiol and Flint are applied in May during bloom. Microthiol (Kryocide insecticide included) is applied at the second spray in May. Rally and Microthiol are applied twice in June (Provado insecticide included with second application). 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 developing 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/or 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. The grapes are picked for table grapes in August and packed in the field. Harvesting crews work in teams of three or four. Depending on fruit quality, the team can pick and pack an average of 3 to 6 boxes per hour per individual and for this study; the picker picks four shipping boxes per hour. Two or three pickers field pick and trim the grapes, and put them in reusable field boxes. Approximately four field boxes are loaded on a wheelbarrow type cart and delivered to the packing person who trims, puts them in bags that are then placed in shipping boxes. The box holds 12 bags and weighs 21-pounds when filled. The packed boxes are loaded on a truck and hauled to storage. The swamp and haul cost includes the boxes, plastic bags, hauling 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.

Average Yields	
Year	Tons/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.
Boxes = 19 lbs

Yields. This study uses a yield of 900, 21-pound boxes to calculate returns. Average county yields for all table grape varieties are shown in Table C. The averages include all vineyards in production regardless of maturity and varieties.

Returns. Return prices for grapes at different yields and price are shown in Table 5. Based on grower information, an estimated price of \$12 per box for Redglobe grapes is used in this study.

Assessments/Inspection. The California Table Grape Commission (CTGC) assesses \$0.1278 per 21-pound box or \$0.006087 per pound. Table grapes are inspected for quality control and charged an additional \$0.035 per box. 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 two hours per acre 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 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.

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 the costs 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 third year the first year that grapes are harvested. It is used to determine the non-cash overhead expense, capital recovery cost, during the production years. In this study, no crop was produced in the second year; therefore, the Total Accumulated Net Cash Cost on Table 1, in the third year represents the establishment cost. For this study the cost is \$6,642 per acre or \$265,680 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.

REFERENCES

- Agriculture Commissioner. 2002 – 2006. *Crop Reports*. Fresno County Ag Commissioner, Fresno, CA.
- American Society of Agricultural Engineers. (ASAE). 1994. *American Society of Agricultural Engineers Standards Yearbook*. St. Joseph, Missouri.
- Boehlje, Michael D., and Vernon R. Eidman. 1984. *Farm Management*. John Wiley and Sons. New York, New York
- California Chapter of the American Society of Farm Managers and Rural Appraisers. 2007. *Trends in Agricultural Land and Lease Values*. California Chapter of the American Society of Farm Managers and Rural Appraisers, Inc. Woodbridge, CA.
- California State Automobile Association. 2007. *Gas Price Survey 2006*. AAA Public Affairs, San Francisco, CA.
- California State Board of equalization. *Fuel Tax Division Tax Rates*. Internet accessed January 2007. <http://www.boe.ca.gov/sptaxprog/spftdrates.htm>
- Christensen, Pete. *Training Table Grape Vineyards*. 1998. University of California Cooperative Extension, Tulare, CA. Pub. #TB 11-98.
- Doanes. 1984. *Facts and Figures for Farmers*. 1984. Doane Publishing, St. Louis, MO.
- Energy Information Administration. 2006. *Weekly Retail on Highway Diesel Prices*. Internet accessed January 2007. <http://tonto.eia.doe.gov/oog/info/wohdp>
- Jensen, Frederick L., William L. Peacock. *Thompson Seedless*. 1998. University of California Cooperative Extension, Tulare, CA. Pub # TB7-97.
- Hashim, Jennifer M., George M. Leavitt William L. Peacock, Stephen J. Vasquez, Nick K. Dokoozlian, Karen L. Klonsky, Donald G. Katayama, and Richard L. De Moura. 2004. *Sample Costs to Establish and Produce Table Grapes, RedGlobe, San Joaquin Valley*. University of California Cooperative Extension and the Department of Agricultural and Resource Economics. Davis, CA.
- University of California Statewide Integrated Pest Management Program. *UC Pest Management Guidelines, Grapes*. 2006. University of California, Davis, CA. <http://www.ipm.ucdavis.edu>

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 RED GLOBE TABLE GRAPE VINEYARD
 SAN JOAQUIN VALLEY SOUTH - 2007

	Cost Per Acre			
	Year:	1st	2nd	3rd
Boxes Per Acre:	0	0	500	
Planting Costs:				
Site Prep: Subsoil 2X	400			
Site Prep: Float (Level)	12			
Site Prep: Disc/Apply Herbicide (Treflan)	17			
Site Prep: Disc/Incorporate Herbicide	12			
Plant: Survey & Layout Vineyard	70			
Plant: Plant, Wrap Vines	166	2		
Vines: 518 Per Acre (2% Replant In 2nd Year)	1,606	31		
Trellis: Trellis System (custom)			4,000	
TOTAL PLANTING COSTS	2,282	4,033		
Cultural Costs:				
Vertebrate: (Rabbit, Gopher, Squirrel)	40	15		15
Fertilize: Nitrogen (UN32)	3	12		23
Irrigate: Water/Labor	54	107		181
Weed: Disc Middle - 2X/Yr 1	16			
Weed: Mow Middle - 2X/Yr 1, 4X/Yr 2, 3X/Yr 3	16	31		24
Weed: Hand Hoe	34			
Prune: Dormant		73		79
Training: (Sucker, Tie)		271		136
Insect: Skeletonizer (Kryocide). Disease: Mildew (Microthiol)		36		36
Weed: Spot Spray (Roundup)		42		42
Weed: Winter Strip Spray (Roundup, Surflan)		53		53
Prune: Shred prunings				15
Disease: Phomopsis (Microthiol, Abound)				51
Disease: Mildew Control (Microthiol)				20
Insect: Leafhoppers 1X (Provado)				46
Disease: Mildew (Kocide, Rubigan)				50
Disease: Mildew 4X (Sulfur Dust)				39
Disease: Mildew 2X, (Rubigan)				56
Pickup: Business use	82	82		82
ATV: Field use	30	38		38
TOTAL CULTURAL COSTS	274	761		985
Harvest Costs:				
Pick & Field Pack (labor)				1,414
Spread/Stack boxes, Swamp, Haul (includes boxes, bags, labor)				1,147
Brokerage Fee				540
Assessment & Inspection Fees				64
TOTAL HARVEST COSTS				3,165
Interest On Operating Capital @ 10.00%	210	373		59
TOTAL OPERATING COSTS/ACRE	2,539	5,163		4,208
Cash Overhead Costs:				
Office Expense	80	80		80
Liability Insurance	6	6		6
Sanitation Service	19	19		19
Property Taxes	85	87		88
Property Insurance	9	10		11
Investment Repairs (non-cash overhead items)	42	42		42
TOTAL CASH OVERHEAD COSTS	242	244		246
TOTAL CASH COSTS/ACRE	2,781	5,407		4,455
INCOME/ACRE FROM PRODUCTION	0	0		6,000
NET CASH COSTS/ACRE FOR THE YEAR	2,781	5,407		0
PROFIT/ACRE ABOVE CASH COSTS	0	0		1,545
ACCUMULATED NET CASH COSTS/ACRE	2,781	8,187		6,642

UC COOPERATIVE EXTENSION

Table 1. continued

	Cost Per Acre			
	Year:	1st	2nd	3rd
	Boxes Per Acre:	0	0	500
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	74	95
TOTAL CAPITAL RECOVERY COST		751	787	809
TOTAL COST/ACRE FOR THE YEAR		3,531	6,194	5,263
INCOME/ACRE FROM PRODUCTION		0	0	6,000
TOTAL NET COST/ACRE FOR THE YEAR		3,531	6,194	0
NET PROFIT/ACRE ABOVE TOTAL COST		0	0	737
TOTAL ACCUMULATED NET COST/ACRE		3,531	9,726	8,989

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE TO PRODUCE REDGLOBE TABLE GRAPES
 SAN JOAQUIN VALLEY SOUTH - 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			
Cultural:								
Vine: Layering Missing Vines	1.00	11	0	0	0	11		
Prune: Vines	15.00	170	0	0	0	170		
Prune: Brush Disposal	0.50	9	7	0	0	15		
Trellis: Repair	2.00	23	0	10	0	33		
Weed: Winter Strip (Surflan, Roundup)	0.49	9	5	40	0	53		
Vertebrate: Gopher, Squirrel, Coyote, Bird (various methods)	0.00	0	0	15	0	15		
Insect: Mealybug (Lorsban)	0.50	9	7	25	0	41		
Disease: Phomopsis (Abound)/Mildew (Sulfur)	0.50	9	7	35	0	51		
Weed: Mow Middles 4X	0.74	13	11	0	0	24		
Disease: Mildew 3X (Dusting Sulfur)	0.84	15	9	6	0	30		
Sucker: Remove Trunk Suckers	2.00	23	0	0	0	23		
Disease: Mildew (Rally, Sulfur). Fertilize: Foliar Zinc (Neutral Zinc)	0.50	9	7	28	0	44		
Fertilize: N through drip system (UN32)	0.00	0	0	23	0	23		
Irrigate: (Water)	2.55	29	0	165	0	194		
*CM: Shoot Thin/Position & Leaf Removal	40.00	452	0	0	0	452		
Disease: Mildew (Sulfur, Flint)	0.50	9	7	34	0	49		
Disease: Mildew (Sulfur). Insect: Skeletonizer (Kryocide)	0.50	9	7	19	0	35		
Disease: Mildew (Sulfur, Rally)	0.50	9	7	23	0	38		
CM: Cane Cutting (Mechanical)	0.29	5	3	0	0	8		
*FM: Cluster Tipping and Thinning	25.00	283	0	0	0	283		
FM: Girdling	12.00	136	0	0	0	136		
Disease: Mildew (Rally, Sulfur)/ Insect: Leafhopper (Provado)	0.50	9	7	67	0	82		
Weed: Spot Spray (Roundup)	0.53	9	1	4	0	14		
Pickup: Business Use	2.39	42	40	0	0	82		
ATV: Irrigation and other	2.00	35	3	0	0	38		
**TOTAL CULTURAL COSTS/ACRE	110.83	1,324	126	494	0	1,944		
TOTAL CULTURAL COSTS/Box		1.47	0.14	0.55	0.00	2.16		
Harvest (900 boxes/acre):								
Pick and Field Pack	225.00	2,545	0	0	0	2,545		
Boxes, Spread, Swamp & Haul	1.75	325	14	1,818	0	2,157		
Brokerage Fee	0.00	0	0	0	972	972		
Assessment & Inspection Fees	0.00	0	0	126	0	126		
TOTAL HARVEST COSTS/ACRE	226.75	2,870	14	1,944	972	5,799		
TOTAL HARVEST COSTS/Box		3.19	0.02	2.16	1.08	6.44		
Interest on operating capital @ 10.00%						117		
TOTAL OPERATING COSTS/ACRE		4,193	140	2,438	972	7,860		
TOTAL OPERATING COSTS/Box		4.66	0.16	2.71	1.08	8.73		
CASH OVERHEAD:								
Office Expense						80		
Liability Insurance						6		
Sanitation Fees						19		
Property Taxes						122		
Property Insurance						35		
Investment Repairs						42		
TOTAL CASH OVERHEAD COSTS						305		
TOTAL CASH COSTS/ACRE						8,165		

*CM = Canopy Management. FM = Fruit Management

**To find cost per box divide by 900

UC COOPERATIVE EXTENSION

Table 2. continued

Operation	Operation	Cash and Labor Cost per acre					Total Cost	Your Cost
	Time (Hrs/A)	Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent			
NON-CASH OVERHEAD:		Per producing		-- Annual Cost --				
Investment		<u>Acres</u>		<u>Capital Recovery</u>				
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		6,642		613		613		
Equipment		820		109		109		
TOTAL NON-CASH OVERHEAD COSTS		16,872		1,435		1,435		
TOTAL COSTS/ACRE						9,600		
TOTAL COSTS/box						10.67		

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

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Redglobe Table Grapes (21 lb box)	900	box	12.00	10,800	
OPERATING COSTS					
Trellis System:					
Miscellaneous Repair Materials	1.00	acre	10.00	10	
Herbicide:					
Surflan 4 AS	2.40	pint	14.52	35	
Roundup Ultra Max	1.10	pint	7.80	9	
Vertebrate Control:					
Shoot, Bait, Trap	1.00	acre	15.00	15	
Fungicide:					
Abound (Strobilurin)	12.00	floz	2.86	34	
Microthiol Disperss (micronized wettable sulfur)	9.00	lb	0.83	7	
Dusting Sulfur	30.00	lb	0.22	6	
Rally 40W (Sterol Inhibitor)	12.00	oz	5.23	63	
Flint (Strobilurin)	2.00	oz	16.50	33	
Insecticide:					
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	
Fertilizer:					
Neutral Zinc 50% (foliar)	5.00	lb	1.08	5	
UN 32	50.00	lb N	0.46	23	
Water:					
Water Pumped SJV	36.00	acin	4.59	165	
Harvest Supplies:					
Box 21 lb	900.00	box	1.60	1,440	
Plastic Bags 12/box	10,800.00	bags	0.04	378	
Contract:					
Brokerage Fee (9% of selling price)	900.00	box	1.08	972	
Assessment:					
Table Grape Commission	900.00	box	0.13	115	
Quality Inspection (1/3 of yield)	300.00	box	0.04	11	
Labor (machine)	15.63	hrs	14.63	229	
Labor (non-machine)	350.55	hrs	11.31	3,965	
Fuel - Gas	11.78	gal	2.80	33	
Fuel - Diesel	22.37	gal	2.30	51	
Lube				13	
Machinery repair				43	
Interest on operating capital @ 10.00%				117	
TOTAL OPERATING COSTS/ACRE				7,861	
NET RETURNS ABOVE OPERATING COSTS				2,939	
CASH OVERHEAD COSTS:					
Office Expense				80	
Liability Insurance				6	
Sanitation				19	
Property Taxes				122	
Property Insurance				35	
Investment Repairs				42	
TOTAL CASH OVERHEAD COSTS/ACRE				305	
TOTAL CASH COSTS/ACRE				8,165	

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)					
Land				530	
Drip Irrigation System				110	
Building				57	
Tools-Shop/Field				14	
Fuel Tanks 2-300G				2	
Establishment Costs				613	
Equipment				109	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,435	
TOTAL COSTS/ACRE				9,600	
NET RETURNS ABOVE TOTAL COSTS				1,200	

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

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
Cultural:													
Vine: Layering Missing Vines	11												11
Prune: Vines	170												170
Prune: Brush Disposal	15												15
Trellis: Repair	33												33
Weed: Winter Strip (Surflan)		53											53
Vertebrate: Gopher, Squirrel, Coyote, Bird (various methods)			2	2	2	2	2	2	2	2			15
Insect: Mealybug (Lorsban)			41										41
Disease: Phomopsis (Abound)/Mildew (Sulfur)			51										51
Weed: Mow Middles 3X			8		8		8						24
Disease: Mildew (Sulfur Dust)				10		10	10						30
Sucker: Trunk				23									23
Disease: Mildew (Sulfur Rally)/ Fertilize: (Zn)				44									44
Fertilize: (UN32) through drip				23									23
Irrigate: (water & labor)				6	22	37	48	44	31	6			194
*CM: Shoot Thin/Position & Leaf Removal				452									452
Disease: Mildew (Sulfur, Flint)					49								49
Disease: Mildew (Sulfur). Insect: Skeletonizer (Kryocide)					35								35
Disease: Mildew (Rally, Sulfur)						38							38
CM: Cane Cutting (Mechanical)						8							8
*FM: Cluster Tipping & Thinning						283							283
FM: Girdle						136							136
Disease: Mildew (Rally, Sulfur). Insect: Leafhopper (Provado)						82							82
Weed: Spot Spray (Roundup)						14							14
Pickup Truck Use	7	7	7	7	7	7	7	7	7	7	7	7	82
ATV	3	3	3	3	3	3	3	3	3	3	3	3	38
TOTAL CULTURAL COSTS	239	63	111	570	126	620	78	55	43	18	10	10	1,944
Harvest:													
Pick & Field Pack								2,545					2,545
Boxes, Spread, Swamp & Haul								2,157					2,157
Brokerage Fee								972					972
Assessment & Inspection Fees								126					126
TOTAL HARVEST COSTS								5,799					5,799
Interest on operating capital @ 10.00%	2	3	3	8	9	14	15	64	0	0	0	0	117
TOTAL OPERATING COSTS/ACRE	241	66	115	578	135	635	93	5,918	42	18	10	10	7,861
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			19
Property Taxes	61						61						122
Property Insurance	18						18						35
Investment Repairs	4	4	4	4	4	4	4	4	4	4	4	4	42
TOTAL CASH OVERHEAD COSTS	91	12	12	12	12	12	91	12	18	12	10	10	305
TOTAL CASH COSTS/ACRE	332	78	127	590	147	647	184	5,931	60	30	20	20	8,165

* CM = Canopy Management. FM = Fruit Management. ** To find cost per box divide by 900

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

COSTS PER ACRE AT VARYING YIELD TO PRODUCE REDGLOBE TABLE GRAPES

	YIELD (21 lb box/acre)						
	600	700	800	900	1,000	1,100	1,200
OPERATING COSTS:							
Cultural Cost	1,944	1,944	1,944	1,944	1,944	1,944	1,944
Harvest Cost	3,134	3,657	4,179	4,701	5,224	5,746	6,269
Brokerage Fee	648	756	864	972	1,080	1,188	1,296
Assessment/Inspection Cost	84	98	112	126	140	154	168
Interest on operating capital @ 10.00%	101	107	112	117	123	128	134
TOTAL OPERATING COSTS/ACRE	5,911	6,562	7,211	7,860	8,511	9,160	9,811
Total Operating Costs/box	9.85	9.37	9.01	8.73	8.51	8.33	8.18
CASH OVERHEAD COSTS/ACRE	304	304	304	305	305	305	305
TOTAL CASH COSTS/ACRE	6,215	6,866	7,515	8,165	8,816	9,465	10,116
Total Cash Costs/box	10.36	9.81	9.39	9.07	8.82	8.60	8.43
NON-CASH OVERHEAD COSTS/ACRE	1,426	1,429	1,432	1,435	1,437	1,440	1,442
TOTAL COSTS/ACRE	7,641	8,295	8,947	9,600	10,253	10,905	11,558
Total Costs/box	12.73	11.85	11.18	10.67	10.25	9.91	9.63

NET RETURNS PER ACRE ABOVE OPERATING COSTS

PRICE \$/box	YIELD (21 lb box/acre)						
	600	700	800	900	1,000	1,100	1,200
8.00	-1,111	-962	-811	-660	-511	-360	-211
9.00	-511	-262	-11	240	489	740	989
10.00	89	438	789	1,140	1,489	1,840	2,189
11.00	689	1,138	1,589	2,040	2,489	2,940	3,389
12.00	1,289	1,838	2,389	2,940	3,489	4,040	4,589
13.00	1,889	2,538	3,189	3,840	4,489	5,140	5,789
14.00	2,489	3,238	3,989	4,740	5,489	6,240	6,989

NET RETURNS PER ACRE ABOVE CASH COSTS

PRICE \$/box	YIELD (21 lb box/acre)						
	600	700	800	900	1,000	1,100	1,200
8.00	-1,415	-1,266	-1,115	-965	-816	-665	-516
9.00	-815	-566	-315	-65	184	435	684
10.00	-215	134	485	835	1,184	1,535	1,884
11.00	385	834	1,285	1,735	2,184	2,635	3,084
12.00	985	1,534	2,085	2,635	3,184	3,735	4,284
13.00	1,585	2,234	2,885	3,535	4,184	4,835	5,484
14.00	2,185	2,934	3,685	4,435	5,184	5,935	6,684

NET RETURNS PER ACRE ABOVE TOTAL COSTS

PRICE \$/box	YIELD (21 lb box/acre)						
	600	700	800	900	1,000	1,100	1,200
8.00	-2,841	-2,695	-2,547	-2,400	-2,253	-2,105	-1,958
9.00	-2,241	-1,995	-1,747	-1,500	-1,253	-1,005	-758
10.00	-1,641	-1,295	-947	-600	-253	95	442
11.00	-1,041	-595	-147	300	747	1,195	1,642
12.00	-441	105	653	1,200	1,747	2,295	2,842
13.00	159	805	1,453	2,100	2,747	3,395	4,042
14.00	759	1,505	2,253	3,000	3,747	4,495	5,242

UC COOPERATIVE EXTENSION
Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
 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 ft	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	0	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	20		6,610	286	400	1,600	8,895
Drip Irrigation System 115 acres	50,000	25		4,388	179	250	1,000	5,816
Vineyard Establishment	265,680	23		24,519	948	1,328	0	26,796
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	1,254,180		841,850	98,316	1,485	10,480	2,970	113,252

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 SOUTH - 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	1.12	7.79	8.91	11.93
07	ATV 4WD	400	1.69	0.05	0.07	0.49	1.07	1.56	3.37
07	Brush Shredder 6 ft	133	3.89	0.14	0.20	3.49	0.00	3.49	7.72
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	Truck Flatbed (10 ton)	150	0.18	0.01	0.01	0.09	0.00	0.09	0.29
07	Sprayer ATV 20 gal	200	20.65	0.78	1.09	5.30	2.64	7.94	30.46
07	Weed Sprayer 3 PT 100 gal	200	1.58	0.05	0.07	0.68	0.00	0.68	2.38

UC COOPERATIVE EXTENSION
Table 8. OPERATIONS WITH EQUIPMENT FOR RED GLOBE TABLE GRAPES
 SAN JOAQUIN VALLEY SOUTH - 2007

Operation	Operation			Material	Broadcast Rate/acre	Unit
	Month	Tractor	Implement			
Weed: Winter Strip	March	60HP 4WD	Weed Sprayer	Surflan	2.40	pt
				Roundup	.60	pt
Weed: Mow Middles	March	60HP 4WD	Mower Flail 8'			
	May	60HP 4WD	Mower Flail 8'			
	July	60HP 4WD	Mower Flail 8'			
Weed: Spot Spray	June	ATV 4WD	Weed Sprayer	Roundup	0.50	pt
Fertilizer through Drip	April			UN 32	50.00	lb N
Irrigation	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
	October			Water	1.00	acin
Disease: Phomopsis/Mildew	March	60HP 4WD	Air Blast Sprayer	Abound	12.00	floz
				Microthiol	1.00	lb
Vertebrate Control:	Mar – Oct			Various Methods	15.00	acre
Disease: Mildew 3X	April	60HP 4WD	Duster	Sulfur Dust	10.00	lb
	June	60HP 4WD	Duster	Sulfur Dust	10.00	lb
	July	60HP 4WD	Duster	Sulfur Dust	10.00	lb
Disease: Mildew. Fertilize: Zinc	April	60HP 4WD	Air Blast Sprayer	Microthiol (Mildew)	2.00	lb
				Rally (Mildew)	4.00	oz
				Neutral Zinc	5.00	lb
Disease: Mildew	May	60HP 4WD	Air Blast Sprayer	Microthiol (Mildew)	2.00	lb
				Flint (Mildew)	2.00	oz
Disease: Mildew. Insect: Skeletonizer	May	60HP 4WD	Air Blast Sprayer	Microthiol (Mildew)	1.00	lb
				Kryocide (Skeletonizer)	6.00	lb
Disease: Mildew	June	60HP 4WD	Air Blast Sprayer	Microthiol (Mildew)	2.00	lb
				Rally (Mildew)	4.00	oz
Disease: Mildew. Insect: Leafhopper	June	60HP 4WD	Air Blast Sprayer	Microthiol (Mildew)	2.00	lb
				Rally (Mildew)	4.00	oz
				Provado (Leafhopper)	1.00	oz
Trellis: Repair	January			Labor	2.00	hrs
				Trellis Materials	10.00	acre
Vine: Layering Vines	January			Labor	1.00	hrs
Prune: Dormant	January			Labor	20.00	hrs
Prune: Shred Brush	January	60HP 4WD	Mower Flail 8'			
Insect: Mealybug	March	60HP 4WD	Air Blast Sprayer	Lorsban	4.00	pt
*CM: Shoot Thin/Position & Leaf Removal	April			Labor	40.00	hrs
CM: Cane Cutting (Mechanical)	June	60HP 4WD	Cane Cutter			
Sucker: Remove Trunk Suckers	April			Labor	2.00	hrs
*FM: Cluster Tipping & Thinning	June			Labor	25.00	hrs
FM: Girdle	June			Labor	12.00	hrs
Pickup: Truck Use	Annual	Pickup 1/2 ton				
ATV:	Annual	ATV				
Harvest: Pick & Pack	August			Labor	175.00	hrs
Harvest: Swamp, Spread, Haul	August	Truck Flatbed		Labor	26.00	hrs
				Boxes	900.00	boxes
				Plastic bags	10,800	bags

*CM = Canopy Management. FM = Fruit Management