SAMPLE COSTS TO
ESTABLISH AND PRODUCE
TABLE GRAPES
THOMPSON SEEDLESS

SAN JOAQUIN VALLEY

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INTRODUCTION

Sample costs to establish a vineyard and produce Thompson 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 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) 752-4424 or obtained from the local county UC Cooperative Extension offices. Some archived studies are also available on the website.
ASSUMPTIONS

The assumptions refer to Tables 1 to 8 and pertain to sample costs to establish a vineyard and produce Thompson Seedless table grapes in the San Joaquin Valley. The cultural practices described and materials used are considered typical for a well-managed vineyard in the region. The costs, materials, and practices 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. Thompson Seedless vineyard establishment and table grape production is on 40 acres. Other varieties are on 75 acres and roads, irrigation systems, and farmstead occupy five acres. The farm is owned and managed by the grower.

Establishment Operating Costs

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 to 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 9 vines per acre are replaced.

Vines. The Thompson Seedless plants are dormant, bench-grafted rootstock vines purchased from a commercial nursery. The grapevines are planted during the first spring on an 8-foot x 12-foot spacing (vine x row) with 454 vines per acre. Vines are trained during the second and third years. The grapevines are expected to begin yielding fruit in three years 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 canopy support, and three wires, 14 gauge high tensile, are used for movable catch wires and drip hose support.
Train/Prune. Dormant season pruning begins the second year. Along with training the selected canes, training also includes suckering and tying canes. Suckering is the removal of water sprouts from the trunk. As the vines mature and grow larger, pruning costs increase and training costs decrease. Training continues through the third year. Selecting and tying canes to fruiting wires is required each year for the life of the vineyard.

Irrigate. Water pumping costs plus labor constitute the irrigation cost. In this study, water is calculated to cost $3.36 per acre-inch or $40.32 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 March through August 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.

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 and equally split applications in May and June of the third 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. Sources of nitrogen such as irrigation well water should be calculated to determine the need to irrigate and fertilize.

Pest Management. For pest identification, monitoring, management and pesticide information, visit the UC IPM website at www.ipm.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.

Insects. Western grapeleaf skeletonizer (Harrisina brillians) is controlled in April of the second and third years with an application of Kryocide insecticide (mixed with micronized sulfur sprays). In the third year, Provado insecticide is applied in June to control the grape leafhoppers (Erythronoeura elegantula). Insects such as mealybugs (Pseudococcus sp.) are monitored each year and may add additional costs if found.

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 the second year, Microthiol (micronized sulfur) for mildew is applied (with Kryocide insecticide application) in April. In March of the third year, 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 three 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

<table>
<thead>
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<th>Year</th>
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<tr>
<td>1</td>
<td>8</td>
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<td>2</td>
<td>18</td>
</tr>
<tr>
<td>3+</td>
<td>36</td>
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</table>

Table A. Irrigation Water Applied

<table>
<thead>
<tr>
<th>Year</th>
<th>Nitrogen (N) Per Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>5</td>
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<td>2</td>
<td>20</td>
</tr>
<tr>
<td>3</td>
<td>40</td>
</tr>
<tr>
<td>4+</td>
<td>50</td>
</tr>
</tbody>
</table>

Table B. Applied Nitrogen (N) Per Acre
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 acquiring fungicide resistance.

*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 four times in the second year and three times in the third 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.

**Harvest/Yield/Returns.** Harvest begins the third year and the fruit is picked for wine. A contractor hand harvests the crop for $45 per ton. Harvest includes hand picking the grapes into bins, furnished by the contractor, and hauling to the winery. A six-ton per acre yield is assumed in the third year.

**Production Operating Costs**

**Prune/Sucker/Canopy Management (CM).** The vines are cane-pruned during the winter months (December and January) and the prunings are placed in the row middles and shredded. In February, the canes are tied to a trellis wire(s) by twisting around the trellis wire and tying with twine or vinyl tape. Suckers are removed from the vine trunks and crowns during April. Shoot positioning is done in May. Cane cutting is done in June with the growers equipment.

**Fruit Management (FM).** Gibberellic acid (GA), a plant growth regulator, is applied four times: two times in May during bloom for thinning at 12 grams per acre per application and two times in June, two weeks after full bloom and one week later for berry sizing at 60 grams per acre per application (disease and insect materials are included with these applications). A third sizing application (not included in this study) at 40 grams per acre is sometimes applied about one-week later to delay maturity. Vines are girdled in June, two to three weeks after full bloom. Cluster tipping and hand thinning are done in late May to early June after girdling to loosen clusters, and adjust cluster length and crop load.

**Trellis/Vines.** Trellis repairs are done annually and the cost is not taken from any specific data. Sick vines are replaced by layering. One year-old canes from vines are buried 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 costs increase with vineyard age.

**Irrigate.** The vineyard is drip irrigated during the growing season from April through October. Deficit irrigation (80% ET) is applied post-harvest to control vine growth and promote cane maturity. Water pumping costs plus labor constitute the irrigation cost. In this study, water is calculated to cost $3.36 per acre-inch or $40.32 per acre-foot. The pumping cost is based on a 40 horsepower (HP) motor to pump from 130 feet deep 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 can be applied 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. 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 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 second bloom thinning spray in May. Grape leafhoppers (Erythroneura elegantula) are controlled with Provado insecticide (mixed with GA, Microthiol, Flint) during the second 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 (Uncinula necator). Phomopsis and powdery mildew are both treated in late March (shoot length 2 inches) with Microthiol (micronized sulfur) and Abound (strobilurin). Mildew is controlled during the season 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 and Flint, a strobilurin (with GA) are applied with the first May bloom thin spray. Microthiol (with GA and Kryocide) is applied with the second bloom thin spray in May. Microthiol and Rally, an SI (with GA) are applied with the first berry size spray in June and Microthiol and Flint, a strobilurin (with GA and Provado) with the second berry size spray in June. Growers have the option of using sterol inhibitors (SI), quinolins, strobilurins, or sulfur (micronized, wettable, dust, flowable), as well as other fungicides to control powdery mildew. These materials are classes of fungicides with different modes of action. Check the IPM website under grapes for management options to control powdery mildew. It is recommended that applicators use fungicides with different modes of action in order to avoid fungicide resistance in powdery mildew populations.
Harvest. Beginning in the fourth year, the grapes are harvested for table grapes and packed in the field. Harvest crews work in teams of three or four people. Depending upon fruit quality, a crew can pick 3 to 7 boxes per hour per individual. In this cost analysis it is assumed that each individual packs five boxes per hour. Two or three crew members field pick and trim grape clusters and place them into boxes, which are then palletized. Approximately four field boxes are loaded on a wheelbarrow and delivered to the packer who finish trims and bags the bunches, which are then placed in shipping boxes. The box holds 9 bags of grapes and contains 19 pounds of fruit. The palletized boxes are loaded on a truck and hauled to a cold storage facility. The swamp and haul costs includes the boxes, plastic bags and related labor. Cold storage and palletization costs may in some cases be a grower cost but is generally charged to the buyer. Selling costs are paid by the grower and may range from 7 to 10%. A figure of 10% of gross price is used in this study and assumes that the grower will be reimbursed for cooling and palletizing.

Yields. This study based on grower input uses an average yield of 800 19-pound boxes over the remaining life of the vineyard. Average yields shown in Table C are the average of all table grape varieties.

Returns. Return prices for grapes at different yields and price are shown in Table 5. An estimated price of $11 per box for Thompson Seedless grapes is used in this study.

Assessments/Inspection. The California Table Grape Commission (CTGC) assesses $0.12 per 19-pound box. Table grapes are inspected for quality control and charged an additional $0.025 per box. Typically, one-third of the yield is inspected.

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. Labor rates of $12.73 per hour for machine operators and $11.05 for general labor includes payroll overhead of 34%. The basic hourly wages are $9.50 for machine operators and $8.25 for general labor. The overhead includes the employers’ share of federal and California state payroll taxes, workers' compensation insurance for vineyards (code 0040), and a percentage for other possible benefits. Workers' compensation insurance costs will vary among growers, but for this study the cost is based upon the average industry final rate as of January 1, 2004 (California Department of Insurance). 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 $1.45 and $1.88 per gallon, respectively. The fuel prices are averaged based on four California delivery locations plus $0.24 per gallon, which is one-half the difference between the high and low price for regular gasoline in 2003 from the California State Automobile Association Monthly Survey. 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-

<table>
<thead>
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<th>Table C. Table Grapes</th>
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<tr>
<td><strong>Average Yields</strong></td>
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<tr>
<td>Year</td>
</tr>
<tr>
<td>1999</td>
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</tr>
<tr>
<td>2001</td>
</tr>
<tr>
<td>2002</td>
</tr>
<tr>
<td>2003</td>
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</tbody>
</table>

Boxes = 19 lbs.
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 6.89% per year. A nominal interest rate is the typical market cost of borrowed funds. The interest cost of post harvest operations is discounted back to the last harvest month using a negative interest charge.

**Risk.** The risks associated with crop production should not be minimized. While this study makes every effort to model a production system based on typical, real world practices, it cannot fully represent financial, agronomic and market risks, which affect profitability and economic viability. 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 0.676% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $645 for the entire farm.

**Office Expense.** Office and business expenses for 120 acres are estimated at $75 per producing acre or $8,625 annually for the ranch. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc. The cost is assumed and not taken from any specific data.

**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 is included in the contractors 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.* The interest rate of 6.23% used to calculate capital recovery cost is the USDA-ERS’s ten-year average of California’s agricultural sector long-run rate of return to production assets from current income. It is used to reflect the long-term realized rate of return to these specialized resources that can only be used effectively in the agricultural sector.

*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 $4,500 to $6,500 per acre. For this study, the land value was established based on 2003 real estate values; therefore a cost of $5,800 per acre or $6,052 per producing acre is used. It is assumed the grower originally purchased the land with an established vineyard. Cropland with district water in the area ranges from $1,400 to $5,000.

*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 that grapes are harvested (year three). 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 cost. For this study the cost is $6,127 per acre or $245,080 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. 1999 – 2003. Crop Reports. Fresno County Ag Commissioner, Fresno, CA.


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 .
Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A TABLE GRAPE VINEYARD
SAN JOAQUIN VALLEY - 2004

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<thead>
<tr>
<th>Year</th>
<th>Tons Per Acre</th>
<th>Cost Per Acre</th>
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<tbody>
<tr>
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<tr>
<td>Tons Per Acre</td>
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**Planting Costs:**
- **Site Prep:** Subsoil 2X: 300
- **Site Prep:** Float (Level): 9
- **Site Prep:** Disc/Apply Herbicide (Treflan): 14
- **Site Prep:** Disc/Incorporate Herbicide: 9
- **Plant:** Survey & Layout Vineyard: 61
- **Plant:** Dig, Plant, Wrap Vines: 136
- **Vines:** 454 Per Acre (2% Replant In 2nd Year): 1,203
- **Trellis:** Install Trellis System: 3,000

**TOTAL PLANTING COSTS:** 1,732

**Cultural Costs:**
- **Prune & Tie:** Dormant: 67
- **Prune:** Brush Disposal: 10
- **Fertilize:** Nitrogen: 2
- **Irrigate:** Water/Labor: 43
- **Disease:** Phomopsis/Mildew (Abound, Sulfur): 44
- **Training:** (Sucker, Tie): 265
- **Weed:** Disc Middle - 2X/Yr 1: 16
- **Weed:** Mow Middle - 2X/Yr 1, 4X/Yr 2, 3X/Yr 3: 18
- **Weed:** Hand Hoe: 33
- **Insect:** Skeleotnizer (Kryocide), **Disease:** Mildew (Sulfur): 32
- **Disease:** Mildew Control (Sulfur): 17
- **Insect:** Leafhoppers 1X (Provado): 43
- **Disease:** Mildew (Kocide, Rubigan): 34
- **Disease:** Mildew 5X (Dusting Sulfur): 41
- **Weed:** Spot Spray (Roundup): 42
- **Weed:** Winter Strip Spray (Roundup, Surflan): 58
- **Disease:** Mildew 2X, SI (Rubigan): 45
- **Pickup:** Business Use: 64
- **ATV:** Field Use: 26

**TOTAL CULTURAL COSTS:** 202

**Harvest Costs:**
- **Harvest:** Contract: 270

**TOTAL HARVEST COSTS:** 0

**Interest On Operating Capital @ 6.89%:** 88

**TOTAL OPERATING COSTS/ACRE:** 2,022

**Cash Overhead Costs:**
- **Office Expense:** 75
- **Liability Insurance:** 6
- **Sanitation Service:** 19
- **Property Taxes:** 69
- **Property Insurance:** 6
- **Investment Repairs:** 173

**TOTAL CASH OVERHEAD COSTS:** 348

**TOTAL CASH COSTS/ACRE:** 2,370

**INCOME/ACRE FROM PRODUCTION:** 0

**NET CASH COSTS/ACRE FOR THE YEAR:** 2,370

**PROFIT/ACRE ABOVE CASH COSTS:** 0

**ACCUMULATED NET CASH COSTS/ACRE:** 2,370 6,553 6,127
<table>
<thead>
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<th>Year</th>
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<td></td>
<td>Shop Tools</td>
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<td></td>
<td>Fuel Tank &amp; Pump</td>
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<td>Equipment</td>
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<td><strong>TOTAL CAPITAL RECOVERY COST</strong></td>
<td><strong>532</strong></td>
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<td><strong>TOTAL COST/ACRE FOR THE YEAR</strong></td>
<td><strong>2,902</strong></td>
<td><strong>4,719</strong></td>
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<tr>
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<td><strong>INCOME/ACRE FROM PRODUCTION</strong></td>
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<tr>
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<td><strong>NET COST/ACRE FOR THE YEAR</strong></td>
<td><strong>2,902</strong></td>
<td><strong>4,719</strong></td>
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<tr>
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<td><strong>NET PROFIT/ACRE ABOVE TOTAL COST</strong></td>
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<td><strong>TOTAL ACCUMULATED NET COST/ACRE</strong></td>
<td><strong>2,902</strong></td>
<td><strong>7,621</strong></td>
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Table 2. COSTS PER ACRE TO PRODUCE TABLE GRAPEs – Thompson Seedless
SAN JOAQUIN VALLEY - 2004

<table>
<thead>
<tr>
<th>Operation</th>
<th>Time (Hrs/A)</th>
<th>Labor Cost</th>
<th>Fuel, Lube &amp; Repairs</th>
<th>Material Cost</th>
<th>Custom/ Rent</th>
<th>Total Cost</th>
<th>Your Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cultural:</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vines: Layering Missing Vines</td>
<td>1.00</td>
<td>11</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>11</td>
<td></td>
</tr>
<tr>
<td>Prune: Vines</td>
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<tr>
<td>Prune: Brush Disposal (Every Middle)</td>
<td>0.31</td>
<td>5</td>
<td>3</td>
<td>0</td>
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<td>Trellis: Repair</td>
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<td>*CM: Tie Canes</td>
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<td>Weed: Winter Strip (Surfhan, Roundup)</td>
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<td>4</td>
<td>46</td>
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<td>Disease: Phomopsis (Abound)/Mildew (Sulfur)</td>
<td>0.50</td>
<td>8</td>
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<td>Insect: Mealybug (Lorsban)</td>
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<td>Weed: Mow Middles 3X</td>
<td>0.94</td>
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<tr>
<td>Disease: Mildew 3X (Dusting Sulfur)</td>
<td>0.92</td>
<td>14</td>
<td>7</td>
<td>5</td>
<td>0</td>
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<tr>
<td>Sucker: Remove Trunk Suckers</td>
<td>2.00</td>
<td>22</td>
<td>0</td>
<td>0</td>
<td>0</td>
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</tr>
<tr>
<td>Disease: Mildew (Rally, Sulfur). Fertilize: Foliar Zinc (Neutral Zinc)</td>
<td>0.50</td>
<td>8</td>
<td>5</td>
<td>26</td>
<td>0</td>
<td>38</td>
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<tr>
<td>Fertilize: N through drip system (UN32)</td>
<td>0.00</td>
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<td>0</td>
<td>16</td>
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<td>Irrigate: (Water)</td>
<td>2.55</td>
<td>28</td>
<td>0</td>
<td>121</td>
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<td>149</td>
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<tr>
<td>CM: Shoot Positioning</td>
<td>10.00</td>
<td>111</td>
<td>0</td>
<td>0</td>
<td>0</td>
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<tr>
<td>FM: Bloom Thin: (GA). Disease: Mildew (Sulfur, Flint)</td>
<td>0.50</td>
<td>8</td>
<td>5</td>
<td>55</td>
<td>0</td>
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<td>FM: Bloom Thin: (GA). Disease: Mildew (Sulfur). Insect: Skeletonizer (Kryocide)</td>
<td>0.50</td>
<td>8</td>
<td>5</td>
<td>40</td>
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<tr>
<td>FM: Berry Size (GA). Disease: Mildew (Rally, Sulfur)</td>
<td>0.50</td>
<td>8</td>
<td>5</td>
<td>121</td>
<td>0</td>
<td>134</td>
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</tr>
<tr>
<td>CM: Cluster Tipping and Thinning</td>
<td>50.00</td>
<td>553</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>553</td>
<td></td>
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<tr>
<td>FM: Girdling</td>
<td>12.00</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>133</td>
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</tr>
<tr>
<td>FM: Cane Cutting (Mechanical)</td>
<td>0.31</td>
<td>5</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>7</td>
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<tr>
<td>FM: Berry Size (GA). Disease: Mildew (Flint, Sulfur). Insect: Leafhopper (Provado)</td>
<td>0.50</td>
<td>8</td>
<td>5</td>
<td>179</td>
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<tr>
<td>Weed: Spot Spray (Roundup)</td>
<td>0.58</td>
<td>9</td>
<td>1</td>
<td>4</td>
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<td>Pickup: Business Use</td>
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<td>36</td>
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<td>0</td>
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<td>64</td>
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<td>ATV Use</td>
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<tr>
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<td>133.04</td>
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<td>92</td>
<td>692</td>
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<td>0.87</td>
<td>0.00</td>
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<td><strong>Harvest: (800 boxes per acre)</strong></td>
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<td>Pick and Field Pack</td>
<td>160.00</td>
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<td>1,768</td>
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<td>Boxes, Spread, Swamp &amp; Haul</td>
<td>20.00</td>
<td>221</td>
<td>0</td>
<td>1,296</td>
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<td>1,517</td>
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<tr>
<td>Commission (precool, palletize, store, sell)</td>
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<td>0</td>
<td>0</td>
<td>0</td>
<td>880</td>
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<td>Assessment &amp; Inspection Fees</td>
<td>0.00</td>
<td>0</td>
<td>0</td>
<td>103</td>
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<td><strong>TOTAL HARVEST COSTS/ACRE</strong></td>
<td>180.00</td>
<td>1,989</td>
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<td>1,399</td>
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<td><strong>TOTAL HARVEST COSTS/Box</strong></td>
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<td>1.75</td>
<td>1.10</td>
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<td>Interest on operating capital @ 6.89%</td>
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<tr>
<td><strong>TOTAL OPERATING COSTS/ACRE</strong></td>
<td>3,507</td>
<td>92</td>
<td>2,091</td>
<td>880</td>
<td>6,652</td>
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<td><strong>TOTAL OPERATING COSTS/Box</strong></td>
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<td><strong>CASH OVERHEAD:</strong></td>
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<td>Office Expense</td>
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<td>Sanitation Fees</td>
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<td>Property Taxes</td>
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<td>Property Insurance</td>
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<td>Investment Repairs</td>
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<td><strong>TOTAL CASH OVERHEAD COSTS</strong></td>
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<tr>
<td><strong>TOTAL CASH COSTS/ACRE</strong></td>
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<td></td>
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<td>7,055</td>
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*CM = Canopy Management. FM = Fruit Management*
<table>
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<tr>
<th>Operation</th>
<th>Time (Hrs/A)</th>
<th>Cash and Labor Cost per acre</th>
<th>Per producing Acre</th>
<th>Annual Cost Capital Recovery</th>
<th>Total Rent Cost</th>
<th>Your Cost</th>
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<tbody>
<tr>
<td>NON-CASH OVERHEAD:</td>
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<tr>
<td>Land</td>
<td>6,052</td>
<td>377</td>
<td>377</td>
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<tr>
<td>Drip Irrigation System</td>
<td>800</td>
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<td>64</td>
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<tr>
<td>Building</td>
<td>522</td>
<td>46</td>
<td>46</td>
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<tr>
<td>Tools-Shop/Field</td>
<td>104</td>
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<tr>
<td>Fuel Tanks 2-300G</td>
<td>30</td>
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<tr>
<td>Vineyard Establishment Costs</td>
<td>6,127</td>
<td>519</td>
<td>519</td>
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<tr>
<td>Equipment</td>
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<td>63</td>
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<tr>
<td>TOTAL NON-CASH OVERHEAD COSTS</td>
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<td>1,082</td>
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<tr>
<td>TOTAL COSTS/ACRE</td>
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<tr>
<td>TOTAL COSTS/Box</td>
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<td>10.18</td>
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</table>
### Table 3. COSTS AND RETURNS to PRODUCE TABLE GRAPES – Thompson Seedless

**SAN JOAQUIN VALLEY - 2004**

<table>
<thead>
<tr>
<th>GROSS RETURNS</th>
<th>Quantity/Acre</th>
<th>Price or Value/Acre</th>
<th>Value or Cost/Acre</th>
<th>Your Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table Grapes Fresh</td>
<td>800.00</td>
<td>box</td>
<td>11.00</td>
<td>8,800</td>
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</tbody>
</table>

#### OPERATING COSTS

**Trellis System:**
- Miscellaneous Repair Materials: 1.00 acre, 10.00
- Materials: 10

**Vine Aids:**
- Tying Materials: 1.00 acre, 11.50
- 12

**Herbicide:**
- Surflan 4 AS: 2.40 pint, 16.96
- Roundup Ultra Max: 1.10 pint, 8.56
- 9

**Fungicide:**
- Abound (Strobilurin): 12.00 fl oz, 2.53
- Microthiol Dispers (micronized wettable sulfur): 11.00 lb, 0.80
- Dusting Sulfur: 30.00 lb, 0.18
- Rally 40W (Sterol Inhibitor): 8.00 oz, 4.89
- Flint (Strobilurin): 4.00 oz, 16.49
- 66

**Insecticide:**
- Lorsban 4E: 4.00 pint, 6.86
- Kryocide: 6.00 lb, 3.00
- Provado 1.6 Solupak: 1.00 oz, 43.96
- 44

**Fertilizer:**
- Neutral Zinc 50% (foliar): 5.00 lb, 0.92
- UN 32: 50.00 lb N, 0.31
- 16

**Water:**
- Water Pumped: 36.00 acin, 3.36
- 121

**Growth Regulator:**
- Gibberelic Acid (ProGibb) 1g=1oz: 144.00 grams, 1.67
- 240

**Harvest Supplies:**
- Box 19 lb: 800.00 box, 1.35
- Plastic Bags (9/box): 7,200.00 bags, 0.03
- 216

**Contract:**
- Commission (10% of $11) includes storage, palletize, sell: 800.00 box, 1.10
- 880

**Assessment:**
- Table Grape Commission: 800.00 box, 0.12
- Quality Inspection (1/3 of yield): 264.00 box, 0.03
- Labor (machine): 13.78 hrs, 12.73
- Labor (non-machine): 301.55 hrs, 11.05
- Fuel - Gas: 11.81 gal, 1.88
- Fuel - Diesel: 21.11 gal, 1.45
- Lube: 8
- Machinery repair: 31
- Interest on operating capital @ 6.89%: 82

**TOTAL OPERATING COSTS/ACRE**: 6,652

**NET RETURNS ABOVE OPERATING COSTS**: 2,148

**CASH OVERHEAD COSTS:**
- Office Expense: 75
- Liability Insurance: 6
- Sanitation: 19
- Property Taxes: 102
- Property Insurance: 28
- Investment Repairs: 173

**TOTAL CASH OVERHEAD COSTS/ACRE**: 402

**TOTAL CASH COSTS/ACRE**: 7,055
<table>
<thead>
<tr>
<th></th>
<th>Quantity/Unit</th>
<th>Price or Value/Acre</th>
<th>Your Cost/Acre</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>NON-CASH OVERHEAD COSTS (Capital Recovery)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Land</td>
<td>377</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drip Irrigation System</td>
<td>64</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Building</td>
<td>46</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tools-Shop/Field</td>
<td>10</td>
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</tr>
<tr>
<td>Fuel Tanks 2-300G</td>
<td>2</td>
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</tr>
<tr>
<td>Vineyard Establishment Costs</td>
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<tr>
<td>Equipment</td>
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<tr>
<td><strong>TOTAL NON-CASH OVERHEAD COSTS/ACRE</strong></td>
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<td><strong>TOTAL COSTS/ACRE</strong></td>
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<tr>
<td><strong>NET RETURNS ABOVE TOTAL COSTS</strong></td>
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### UC Cooperative Extension

#### Table 4. MONTHLY CASH to PRODUCE TABLE GRAPES – Thompson Seedless

**SAN JOAQUIN VALLEY - 2004**

<table>
<thead>
<tr>
<th></th>
<th>JAN 04</th>
<th>FEB 04</th>
<th>MAR 04</th>
<th>APR 04</th>
<th>MAY 04</th>
<th>JUN 04</th>
<th>JUL 04</th>
<th>AUG 04</th>
<th>SEP 04</th>
<th>OCT 04</th>
<th>NOV 04</th>
<th>DEC 04</th>
<th>TOTAL</th>
</tr>
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<tbody>
<tr>
<td><strong>Cultural:</strong></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Vine:</strong> Layering Missing Vines</td>
<td>11</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td><strong>Prune:</strong></td>
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<td></td>
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<tr>
<td><strong>Prune:</strong> Vines</td>
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<tr>
<td><strong>Prune:</strong> Brush Disposal</td>
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<td>60</td>
<td>36</td>
<td>29</td>
<td>29</td>
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</table>

*CM = Canopy Management. FM = Fruit Management **To find cost per box divide by 800

---

2004 Table Grapes Costs and Returns Study

**San Joaquin Valley**

**UC Cooperative Extension**

18
Table 5. RANGING ANALYSIS for TABLE GRAPES – Thompson Seedless
SAN JOAQUIN VALLEY - 2004

COSTS PER ACRE AT VARYING YIELD TO PRODUCE TABLE GRAPES

<table>
<thead>
<tr>
<th>YIELD (19 lb box/acre)</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
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<td>770</td>
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<td>990</td>
<td>1100</td>
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<td>77</td>
<td>90</td>
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<td>115</td>
<td>128</td>
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<td>72</td>
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<tr>
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<td>5,982</td>
<td>6,519</td>
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NET RETURNS PER ACRE ABOVE OPERATING COSTS

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<th>PRICE $/box</th>
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<th>600</th>
<th>700</th>
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NET RETURNS PER ACRE ABOVE CASH COST

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<td>1,218</td>
<td>1,881</td>
<td>2,544</td>
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<td>292</td>
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NET RETURNS PER ACRE ABOVE TOTAL COST

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<th>PRICE $/box</th>
<th>400</th>
<th>500</th>
<th>600</th>
<th>700</th>
<th>800</th>
<th>900</th>
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<td>7.00</td>
<td>-3,190</td>
<td>-3,027</td>
<td>-2,864</td>
<td>-2,701</td>
<td>-2,538</td>
<td>-2,374</td>
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<td>8.00</td>
<td>-2,790</td>
<td>-2,527</td>
<td>-2,264</td>
<td>-2,001</td>
<td>-1,738</td>
<td>-1,474</td>
<td>-1,210</td>
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<td>-1,664</td>
<td>-1,301</td>
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<td>-210</td>
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<td>-1,527</td>
<td>-1,064</td>
<td>-601</td>
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<td>326</td>
<td>790</td>
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<tr>
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<td>-464</td>
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<td>1,790</td>
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<td>12.00</td>
<td>-1,190</td>
<td>-527</td>
<td>136</td>
<td>799</td>
<td>1,462</td>
<td>2,126</td>
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<tr>
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<td>-790</td>
<td>-27</td>
<td>736</td>
<td>1,499</td>
<td>2,262</td>
<td>3,026</td>
<td>3,790</td>
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### Table 6. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, SAN JOAQUIN VALLEY - 2004

#### ANNUAL EQUIPMENT COSTS

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td>04</td>
<td>60 HP 4WD Narrow Tractor</td>
<td>36,000</td>
<td>15</td>
<td>7,009</td>
<td>3,467</td>
<td>145</td>
<td>215</td>
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<td>ATV 4WD</td>
<td>6,700</td>
<td>5</td>
<td>3,003</td>
<td>1,070</td>
<td>33</td>
<td>49</td>
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<td>04</td>
<td>Cane Cutter 12'</td>
<td>2,500</td>
<td>20</td>
<td>130</td>
<td>219</td>
<td>9</td>
<td>13</td>
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<tr>
<td>04</td>
<td>Duster - 3 Point 12'</td>
<td>5,000</td>
<td>5</td>
<td>1,629</td>
<td>907</td>
<td>22</td>
<td>33</td>
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<tr>
<td>04</td>
<td>Mower-Flail 8'</td>
<td>9,600</td>
<td>15</td>
<td>922</td>
<td>964</td>
<td>36</td>
<td>53</td>
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<tr>
<td>04</td>
<td>Orchard/Vine Sprayer 500 gal</td>
<td>20,378</td>
<td>5</td>
<td>6,638</td>
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<td>Pickup Truck 1/2 T</td>
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<td>9,863</td>
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<td>62</td>
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<td>2</td>
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<tr>
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<td>Weed Sprayer 3 Point 100 gal</td>
<td>3,500</td>
<td>10</td>
<td>619</td>
<td>434</td>
<td>14</td>
<td>21</td>
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<td></td>
<td><strong>TOTAL</strong></td>
<td><strong>110,028</strong></td>
<td></td>
<td><strong>29,875</strong></td>
<td><strong>14,329</strong></td>
<td><strong>473</strong></td>
<td><strong>700</strong></td>
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<tr>
<td></td>
<td><strong>60% of New Cost</strong></td>
<td><strong>66,017</strong></td>
<td></td>
<td><strong>17,925</strong></td>
<td><strong>8,597</strong></td>
<td><strong>284</strong></td>
<td><strong>420</strong></td>
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* Used to reflect a mix of new and used equipment.

#### ANNUAL INVESTMENT COSTS

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<th></th>
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<tr>
<td>Building 40' X 60'</td>
<td>60,000</td>
<td>20</td>
<td>5,329</td>
<td>203</td>
<td>300</td>
<td>1,200</td>
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<td>Drip Irrigation System 115 acres</td>
<td>92,000</td>
<td>25</td>
<td>7,355</td>
<td>311</td>
<td>460</td>
<td>18,440</td>
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<tr>
<td>Vineyard Establishment</td>
<td>245,080</td>
<td>22</td>
<td>20,762</td>
<td>828</td>
<td>1,225</td>
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<tr>
<td>Fuel Tanks 2-300 gal</td>
<td>3,500</td>
<td>30</td>
<td>350</td>
<td>13</td>
<td>19</td>
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<td>696,000</td>
<td>25</td>
<td>696,000</td>
<td>0</td>
<td>6,960</td>
<td>0</td>
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<tr>
<td>Tools-Shop/Field</td>
<td>12,000</td>
<td>15</td>
<td>1,133</td>
<td>44</td>
<td>66</td>
<td>240</td>
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<tr>
<td><strong>TOTAL INVESTMENT</strong></td>
<td><strong>1,108,580</strong></td>
<td></td>
<td><strong>697,483</strong></td>
<td><strong>78,269</strong></td>
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#### ANNUAL BUSINESS OVERHEAD COSTS

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<th>Description</th>
<th>Units/ Price/ Total</th>
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<tr>
<td>Liability Insurance</td>
<td>115 acre 5.60 644</td>
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<tr>
<td>Office Expense</td>
<td>115 acre 75.00 8,625</td>
</tr>
<tr>
<td>Sanitation Fee</td>
<td>115 acre 18.96 2,180</td>
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#### Table 7. HOURLY EQUIPMENT COSTS

<table>
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<tr>
<th>Yr</th>
<th>Description</th>
<th>Hours Used</th>
<th>Capital Recovery</th>
<th>Insur- ance</th>
<th>Taxes</th>
<th>Operating</th>
<th>Fuel &amp; Lube</th>
<th>Total Opera.</th>
<th>Total Costs/Hr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>04</td>
<td>60 HP 4WD Narrow Tractor</td>
<td>1066.70</td>
<td>1.95</td>
<td>0.08</td>
<td>0.12</td>
<td>0.88</td>
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<td>ATV 4WD</td>
<td>400.10</td>
<td>1.61</td>
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<td>0.07</td>
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<td>0.72</td>
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<td>0.08</td>
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<td>Tractor</td>
<td>Implement</td>
<td>Material</td>
<td>Broadcast Rate/acre</td>
<td>Unit</td>
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<tr>
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<td>---------------------</td>
<td>------</td>
<td></td>
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<tr>
<td>Weed: Winter Strip</td>
<td>March</td>
<td>60HP 4WD</td>
<td>Weed Sprayer</td>
<td>Surflan</td>
<td>2.40</td>
<td>pt</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Roundup</td>
<td>0.50</td>
<td>pt</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Weed: Mow Middles</td>
<td>March</td>
<td>60HP 4WD</td>
<td>Mower Flail 8'</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>May</td>
<td>60HP 4WD</td>
<td>Mower Flail 8'</td>
<td></td>
<td></td>
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</tr>
<tr>
<td></td>
<td>July</td>
<td>60HP 4WD</td>
<td>Mower Flail 8'</td>
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<td></td>
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</tr>
<tr>
<td>Weed: Spot Spray</td>
<td>June</td>
<td>ATV 4WD</td>
<td>ATV Sprayer</td>
<td>Roundup</td>
<td>0.50</td>
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<td>Fertilize: N through drip</td>
<td>April</td>
<td></td>
<td></td>
<td>UN 32</td>
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<td>lb N</td>
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<td>Irrigation</td>
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</tr>
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<td></td>
<td>May</td>
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<tr>
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<td>July</td>
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</tr>
<tr>
<td></td>
<td>August</td>
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<td></td>
<td>September</td>
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</tr>
<tr>
<td></td>
<td>October</td>
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<td></td>
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</tr>
<tr>
<td>Disease: Phomopsis/Mildew</td>
<td>March</td>
<td>60HP 4WD</td>
<td>Air Blast Sprayer</td>
<td>Abound</td>
<td>12.00</td>
<td>floz</td>
<td></td>
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<tr>
<td>Disease: Mildew 3X</td>
<td>April</td>
<td>60HP 4WD</td>
<td>Duster</td>
<td>Dusting Sulfur</td>
<td>10.00</td>
<td>lb</td>
<td></td>
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<tr>
<td></td>
<td>June</td>
<td>60HP 4WD</td>
<td>Duster</td>
<td>Dusting Sulfur</td>
<td>10.00</td>
<td>lb</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>July</td>
<td>60HP 4WD</td>
<td>Duster</td>
<td>Dusting Sulfur</td>
<td>10.00</td>
<td>lb</td>
<td></td>
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<tr>
<td>Disease: Mildew. Fertilize: Foliar Zinc</td>
<td>April</td>
<td>60HP 4WD</td>
<td>Air Blast Sprayer</td>
<td>Microthiol (Mildew)</td>
<td>2.00</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td></td>
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<td></td>
<td>Rally (Mildew)</td>
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<td>Neutral Zinc</td>
<td>5.00</td>
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<tr>
<td>*FM: Bloom Thin. Disease: Mildew</td>
<td>May</td>
<td>60HP 4WD</td>
<td>Air Blast Sprayer</td>
<td>GA (Thin)</td>
<td>12.00</td>
<td>floz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Microthiol (Mildew)</td>
<td>2.00</td>
<td>lb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flint (Mildew)</td>
<td>2.00</td>
<td>oz</td>
<td></td>
<td></td>
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<tr>
<td>FM: Bloom Thin. Disease: Mildew. Insect: Skeletonizer</td>
<td>May</td>
<td>60HP 4WD</td>
<td>Air Blast Sprayer</td>
<td>GA (Thin)</td>
<td>12.00</td>
<td>floz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Microthiol (Mildew)</td>
<td>2.00</td>
<td>lb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Kryocide (Skeletonizer)</td>
<td>6.00</td>
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<td>June</td>
<td>60HP 4WD</td>
<td>Air Blast Sprayer</td>
<td>GA (Thin)</td>
<td>60.00</td>
<td>floz</td>
<td></td>
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</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Microthiol (Mildew)</td>
<td>2.00</td>
<td>lb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Rally (Mildew)</td>
<td>4.00</td>
<td>oz</td>
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<tr>
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<td>June</td>
<td>60HP 4WD</td>
<td>Air Blast Sprayer</td>
<td>GA (Thin)</td>
<td>60.00</td>
<td>floz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Microthiol (Mildew)</td>
<td>2.00</td>
<td>lb</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Flint (Mildew)</td>
<td>2.00</td>
<td>oz</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insect: Mealbug</td>
<td>March</td>
<td>60HP 4WD</td>
<td>Air Blast Sprayer</td>
<td>Lorsban</td>
<td>4.00</td>
<td>pt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FM: Cluster Tipping &amp; Thinning</td>
<td>June</td>
<td></td>
<td></td>
<td>Labor</td>
<td>50.00</td>
<td>hrs</td>
<td></td>
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<tr>
<td>FM: Girdle</td>
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<td></td>
<td></td>
<td>Labor</td>
<td>12.00</td>
<td>hrs</td>
<td></td>
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</tr>
<tr>
<td>Trellis: Repair</td>
<td>January</td>
<td></td>
<td></td>
<td>Labor</td>
<td>2.00</td>
<td>hrs</td>
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<td></td>
<td>Trellis Materials</td>
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<td>acre</td>
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<tr>
<td>Vine: Layering Vines</td>
<td>January</td>
<td></td>
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<td>Labor</td>
<td>1.00</td>
<td>hrs</td>
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<tr>
<td>Prune</td>
<td>January</td>
<td></td>
<td></td>
<td>Labor</td>
<td>3.50</td>
<td>hrs</td>
<td></td>
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<tr>
<td>Prune: Shred Brush</td>
<td>January</td>
<td>60HP 4WD</td>
<td>Mower Flail 8'</td>
<td>Labor</td>
<td>2.00</td>
<td>hrs</td>
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<tr>
<td>Sucker: Remove Trunk Suckers</td>
<td>April</td>
<td></td>
<td></td>
<td>Labor</td>
<td>7.00</td>
<td>hrs</td>
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<tr>
<td>CM: Tie Canes</td>
<td>February</td>
<td></td>
<td></td>
<td>Materials</td>
<td>11.50</td>
<td>acre</td>
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<tr>
<td>CM: Shoot Positioning</td>
<td>May</td>
<td></td>
<td></td>
<td>Labor</td>
<td>6.00</td>
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<td></td>
<td>July</td>
<td></td>
<td></td>
<td>Labor</td>
<td>4.00</td>
<td>hrs</td>
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<tr>
<td>CM: Cane Cutting</td>
<td>June</td>
<td>60HP 4WD</td>
<td>Cane Cutter</td>
<td>Labor</td>
<td>160</td>
<td>hrs</td>
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<td>Pickup: Business Use</td>
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<td>Pickup 1/2 ton</td>
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<td>hrs</td>
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<td>Harvest: Pick &amp; Field Pack</td>
<td>August</td>
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<td>Labor</td>
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<tr>
<td>Harvest: Swamp, Spread, Haul</td>
<td>August</td>
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<td></td>
<td>Labor</td>
<td>7,200</td>
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*CM = Canopy Management. FM = Fruit Management