
UNIVERSITY OF CALIFORNIA COOPERATIVE EXTENSION

2003

**SAMPLE COSTS TO ESTABLISH A VINEYARD
AND PRODUCE DRIED-ON-VINE**

RAISINS

Early Maturing Varieties



**OVERHEAD TRELLIS SYSTEM
SAN JOAQUIN VALLEY**

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UC COOPERATIVE EXTENSION

SAMPLE COST TO ESTABLISH A VINEYARD AND PRODUCE RAISINS Dried On Vine (DOV) on Overhead Trellis San Joaquin Valley

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INTRODUCTION

Sample costs to establish a vineyard with an overhead trellis system to produce dried-on-the-vine (DOV) raisins 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 are available and can be requested through the Department of Agricultural and Resource Economics, UC Davis, (530) 752-3589. Current studies can be downloaded from the department website at <http://coststudies.ucdavis.edu> or obtained from selected county UC Cooperative Extension offices.

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ASSUMPTIONS

The assumptions refer to Tables 1 to 7 and pertain to sample costs to establish a vineyard in the San Joaquin Valley and produce dried-on-the-vine raisins using an overhead trellis system. The described practices are not University of California recommendations, but represent operations and materials considered typical of a well-managed vineyard in the region. The costs, materials, and practices shown in this study are based on the assumptions and are not applicable to all farms. Establishment and cultural practices vary by farm and the differences can be significant. *The use of trade names in this report does not constitute an endorsement or recommendation by the University of California.*

Land. The vineyard, owned and managed by the grower, is located on previously farmed land in the San Joaquin Valley. The farm is comprised of 160 acres, 75 of which are producing raisins, and 80 acres of raisin grapes being established on an overhead trellis system. Roads, irrigation systems, and farmstead occupy the remaining 5 acres.

Establishment Operating Costs

Site Preparation. This vineyard is established on ground previously planted to vineyards or orchards. Land coming from trees or vines 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 twice to a depth of 2-3 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 trees or vines 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.

Trellis System. A commercial company installs the trellis system in December of the first year or January of the second year (January in this study). The overhead trellis system uses alternating row middles for fruiting and cane renewal. It consists of the following materials: (1) Metal “T” posts, 9-foot long, spaced every 12-feet down the row (two vines per post), stake material is 80 carbon and weighing a minimum of 1.44 pounds per foot; (2) End assemblies are 10-foot Douglas fir post, 5 to 6-inch diameter with screw anchors; (3) Corner assemblies are 6 to 7-inch, 12-foot Douglas fir post with multiple anchors; (4) Perimeter cable is 5/16 inch extra high strength (EHS) cable; deck wires consist of 8, 13 gauge extra high strength (includes one rake wires) in-row direction, and double 12.5 gauge high tensile wire at each stake position across rows. For quadrilateral cordons, an additional \$400 is incurred for cross arms and support wires.

Planting. Planting starts by laying out and marking vine sites in late winter. In the spring, holes are dug and the vines are planted and protected with an open carton placed over the vines. In the second year 2% or 12 vines per acre are replanted for those lost in the first year.

Vines. Early maturing varieties such as Selma Pete, DOVine, or Fiesta are planted on a 6 x 12-foot spacing at 605 vines per acre. They are purchased as dormant vines that have been bench grafted or field budded onto a nematode/phylloxera resistant rootstock. The life of the vineyard is expected to be 30 years and the grapevines expected to begin yielding fruit in three years.

Training/Pruning. Training and pruning establish the vine framework and these techniques will vary with variety and trellis system. In this study, the vines are head trained. Dormant pruning begins in January of the second year. The young vines are pruned back to a 2-bud spur. Training includes suckering, tying, and positioning the selected shoots. The vines are suckered and one shoot tied in April. From April through July, the spare shoots are removed and most of the training is completed by the end of the third year. In February of the third year, two to three canes are tied, and is followed by shoot thinning and flower removal in April, renewal fruit removal in May, shoot positioning in May and June, cane severing at harvest in August, and severed cane removal post harvest.

Irrigation. In this study, the pumped water is calculated to cost \$3.36 per acre-inch or \$40.32 per acre-foot. Water pumping costs plus labor constitute the irrigation cost. The pumping cost is based on a 40 horsepower motor to pump from 130 feet deep. Price per acre-foot of water will vary, depending on quantity used, water district, power cost, well characteristics, and other irrigation factors. Irrigations occur during the growing season from April through early October. No assumption is made about effective rainfall or runoff. The amount of water applied to the vines during the establishment years is shown in Table A.

Year	AcIn/Year
1	12
2	24
3+	36

Pest Management. The pesticides and rates mentioned in this cost study as well as other materials available are listed in *UC Integrated Pest Management Guidelines, Grapes*. Pesticides mentioned in the study are commonly used, but are not recommendations.

Insects. Beginning in the third year, Cryolite insecticide is applied in May during early bloom (combined with the Rubigan and zinc) to control worms (grape leaffolder, omnivorous leafroller, western grapeleaf skeletonizer). Provado insecticide is applied in July to control leafhoppers.

Diseases. Many pathogens attack grapevines, but the major diseases treated in this study are powdery mildew, and Phomopsis cane and leaf spot. A dusting and spraying program for these diseases begins in the third year with a wettable sulfur application soon after budbreak in late March or early April. Dusting sulfur is applied twice in April and once in June. A sterol inhibitor (SI) - Rubigan in this study - is applied in May during early bloom (with the worm and zinc spray) and once in June, two weeks after bloom. In some years, in addition to wettable sulfur, a spring foliar application of an appropriate fungicide such as Ziram may be advisable at budbreak or prior to spring rains for Phomopsis control when the disease pressure is high. A strobilurin fungicide may be used for longer residual effect during extended rain events.

Weeds. Vineyard floor management begins in late winter, February of the second year, with a strip spray in the vine row (4-foot) with Roundup, Surflan, and Goal. The row middles are disced in February and May. The vine rows are spot treated with Roundup in late April and early August.

Fertilization. Liquid nitrogen fertilizer - UN32 - is applied in equal amounts through the drip system in April and September. Fifteen pounds of N is applied in the first year and 25 pounds in the following years. Zinc as neutral zinc is applied with the disease and insect bloom spray.

Harvest. Harvest begins the third year. A contractor hand harvests the crop for \$45 per ton. Harvest consists of hand picking the grapes into bins, furnished by the contractor, and delivery to the winery or

dehydrator. In this system, DOV raisins may be produced in the third year from vineyards having vigorous or adequate growth. Canes are cut and the raisins are picked by hand or harvested by machine.

Yields. The vineyard will yield approximately 2-tons of raisins or 9-tons of fresh fruit per acre in the third year.

Returns. In this study, the fresh fruit is sold to a winery for which the grower receives a current estimated market price of \$75 per ton.

Production Operating Costs

Pruning. Pruning is done during the winter months. The prunings are then shredded and disced (see weeds) into the row middles. The vines are cane pruned with renewal spurs in January, canes tied in February, shoot-thinned in April, shoot positioned in early May, and fruit or flower cluster removed from head in late May. The canes are severed in August in preparation for harvest. The severed canes are removed post-harvest in October and placed in alternate row middles, then shredded.

Fertilization. Twenty-five pounds per acre of nitrogen (N) as UN-32 is divided and applied in equal amounts through the drip lines in April and September. Neutral zinc at five pounds of material per acre is applied with the May powdery mildew management application.

Irrigation. Water pumping costs plus labor, which includes checking the drip lines, 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 using 40 horsepower motor to pump from 130 feet deep over 80 acres. District water will have additional costs. Price per acre-foot of water will vary depending on quantity used, water district, power cost, various well characteristics, and other irrigation factors. Thirty-six acre-inches are applied during the growing season from April through early October. No assumption is made about effective rainfall and runoff.

Pest Management. The pesticides and rates mentioned in this cost study are listed in *UC Integrated Pest Management Guidelines, Grapes*. **Pesticides mentioned in the study are not recommendations, but those commonly used in the region.** For information on other pesticides available, pest identification, monitoring, and management visit the UC IPM website at www.ipm.ucdavis.edu. For information and pesticide use permits, contact the local county agricultural commissioner's office.

Pest Control Advisor (PCA). Written recommendations are required for pesticides commercially applied and are made by licensed pest control advisors. In addition the PCA will monitor the field for agronomic problems including pests and nutrition. Growers may hire private PCA's or receive the service as part of a service agreement with an agricultural chemical and fertilizer company. No costs for a PCA are included in this study.

Weeds. Shading from overhead trellising in mature vineyards, reduces weed germination. The row middles are disced twice – February and May. Vine row weeds are controlled with three Roundup spot sprays – February, April and August.

Insects. Cryolite insecticide is applied in early May at bloom with a powdery mildew spray to control worms (grape leaffolder, omnivorous leafroller, western grapeleaf skeletonizer). Provado Insecticide is applied in July to control leafhoppers.

Disease. Many pathogens attack grapevines, but the major diseases treated in this study are powdery mildew, and Phomopsis cane and leaf spot. A dusting and spraying program for these diseases begins with an application of wettable sulfur soon after budbreak in late March or early April. Dusting sulfur is applied twice in April and once in June. A sterol inhibitor (SI) - Rubigan in this study - is applied in May at early bloom (with the worm and zinc spray) and once in June, two weeks after bloom. In some years, in addition to wettable sulfur, a spring foliar application of an appropriate fungicide such as Ziram may be advisable at budbreak or prior to spring rains for Phomopsis control when the disease pressure is high. A strobilurin fungicide may be used for longer residual effect during extended rain events.

Harvest. Canes bearing fruit are severed by hand in August to allow the fruit to dry on the vine. The fruit is produced in alternate middles. The grower owns a self-propelled harvester, forklift, and flatbed truck. The grower also rents a forklift. The crop is harvested into one-half ton bins carried on the harvester and the cost includes the harvester driver and an assistant. Bin handling includes loading bins on and off the harvester, stacking and/or stacking filled bins on site. The bins, which hold 1,000 to 1,200 pounds, are rented from the packer for \$21 per ton. Approximately 8 to 10 bins per acre are needed. It is assumed that the equipment operators and assistants work hours equivalent to the harvest time. The filled bins after a few days are hauled to the packer on the flatbed truck and the costs are included under bin handling. The truck holds 16-bins (fruit from less than two acres) and it assumed that each round-trip to the packer takes one-hour.

Yields. Raisin vineyards are fully mature by the fourth year and over years will average five-tons per acre. The drying ratio of green fruit to raisins is 4.1 to 4.5:1.

Returns. The estimated return for this study based on current raisin markets is \$600 per ton. The raisin grape market is regulated by a federal marketing order administered by the Raisin Administrative Committee (RAC). Each year, the RAC sets minimum crop standards. In addition, the RAC regulates, on a percentage basis, the amount of the harvested crop that is offered for immediate sale (free tonnage), and the amount of the harvested crop that is held in reserve for later sale (the reserve pool), to control the overall supply of raisin grapes on the market.

Assessments. The California Raisin Marketing Board assesses a \$17.50 per ton fee to support and promote use of California grown raisins.

Packers. Packing costs are not included in this study. The United States Department of Agriculture (USDA) inspects the raisins for maturity, quality, and moisture. The Raisin Administrative Committee (RAC), the administrative arm of the federal marketing order for raisins, sets industry standards. Fees are associated with both the USDA inspections and RAC administrative responsibilities; the packer pays for tonnage fees. Growers receive payment for the free tonnage (commercial sales) portion of their crop from the packer. The reserve tonnage portion (export sales and government purchases) is paid by the RAC. In most cases, the packer retains control of the raisin crop for marketing purposes after inspection.

Pickup/ATV. The grower uses the pickup for business and personal use. The assumed business use is 5,700 miles per year for the ranch. In addition to spot spraying for weed control, the All Terrain Vehicle (ATV) is used on the ranch for checking the vineyard and irrigating.

Labor. Hourly wages for workers are \$9.51 for machine operators and \$8.23 per hour non-machine labor. Adding 34% for the employers share of federal and state payroll taxes, insurance, and other possible benefits gives the labor rates shown of \$12.74 and \$11.02 per hour for machine labor and non-machine labor, respectively. 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 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 \$1.11 and \$1.58 per gallon, respectively. 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 6 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 7.14 % 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 Costs

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm and not to a particular operation. 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 \$715 for the entire farm.

Office Expense. Office and business expenses are estimated at \$75 per acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, shop and office utilities, and miscellaneous administrative charges.

Sanitation Services. Sanitation services provide portable toilets for the vineyard and cost the farm \$1,900 annually. The cost includes two double toilet units with washbasins, delivery and pickup, and five months of weekly servicing. Costs also include soap or other suitable cleansing agent, and single use towers. Separate potable water and single-use drinking cups are also supplied.

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 5.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. The amortization factor is a table value that corresponds to the interest rate used and the life of the machine.

Interest Rate. The interest rate of 6.25% used to calculate capital recovery cost is the 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. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Establishment Cost. Costs to establish the vineyard are used to determine capital recovery expenses, depreciation, and interest on investment for the production years. Establishment cost is the sum of the costs for land preparation, trellis system, planting, vines, cash overhead and production expenses for growing the vines through the first year that grapes are harvested minus any returns from production. The Total Accumulated Net Cash Cost on Table 1, in the third year represents the establishment cost. For this study the cost is \$7,453 per acre or \$596,240 for the 80-acre vineyard. The establishment cost is spread over the remaining 27 years of the 30 years the vineyard is in production.

Irrigation System. The previous vineyard is assumed to have an irrigation system that can be refurbished. A new pump, motor, and filtration/injector station is being installed along with the drip irrigation system during planting. The filtration station, fertilizer injector system, drip lines and the labor to install the components are included in the irrigation system cost. Water is pumped from a 130-foot depth with a 40 horsepower pump and supplies water to the 80 acres. Another 40 horsepower pump and irrigation set-up supplies the rest of the ranch, but is not included. The irrigation system is considered an improvement to the property and has a 30-year life.

Land. The land owned by the grower was formerly a vineyard, but has been out of production for two years. The open land was planted to grain crops. Land for raisin production is valued at \$5,800 per acre. Because only 155 of the 160 acres are planted to crops, land is valued at \$5,987 per planted acre.

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

Tools. This includes shop tools, hand tools, and miscellaneous field tools such as pruning tools.

Fuel Tanks. Two 250-gallon fuel tanks using gravity feed are on metal stands. The tanks are setup in a cement containment pad that meets federal, state, and county regulations.

Equipment. Farm equipment is purchased new or used, but the study shows the current purchase price for new equipment. The new purchase price is adjusted to 60% to indicate a mix of new and used equipment. 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.

Acknowledgment. Appreciation is expressed to those growers and other cooperators who provided support for this study.

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UC COOPERATIVE EXTENSION
Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A RAISIN VINEYARD
 SAN JOAQUIN VALLEY - 2003

	Cost Per Acre			
	Year:	1st	2nd	3rd
Tons Per Acre Fresh:		0.0	0.0	9.0
Planting Costs:				
Land Preparation - Chisel 2X (Custom)		120		
Land Preparation - Float		7		
Land Preparation - Disc/Apply Herbicide		7		
Land Preparation - Disc (Incorporate Herbicide)		5		
Survey & Layout Vineyard		82		
Dig, Plant, Cover Vines		182	2	
Vines on rootstock: 605 Per Acre (2% Replant In 2nd Year)		1,724	34	
Install Trellis System			3,100	
TOTAL PLANTING COSTS		2,127	3,136	0
Cultural Costs:				
Prune - Dormant			55	94
Prune - Training (Sucker, Tie & Train)			331	209
Fertilize	7	9		9
Irrigate	79	112		152
Weed Control - Winter Strip Spray			54	54
Weed Control - Disc Middle			10	10
Weed Control - Hand Hoe				
Weed Control - Spot Spray	18	12		12
Insect Control - OLR & Grapeleaf Skeletonizer				
Insect Control - Leafhoppers				28
Disease Control - Mildew				44
Insect (Worms)/Disease (Mildew)/Fertilize (Zinc)				30
ATV Use	26	26		26
Pickup Truck Use	51	51		51
TOTAL CULTURAL COSTS		181	660	719
Harvest Costs:				
Harvest/Haul - Contract Hand				405
TOTAL HARVEST COSTS		0	0	405
Interest On Operating Capital @ 7.14%		111	187	25
TOTAL OPERATING COSTS/ACRE		2,419	3,983	1,149
Cash Overhead Costs:				
Office Expense		75	75	75
Liability Insurance		5	5	5
Sanitation Services		12	12	12
Property Taxes		68	68	69
Property Insurance		6	6	6
Investment Repairs		26	26	26
TOTAL CASH OVERHEAD COSTS		192	192	193
TOTAL CASH COSTS/ACRE		2,611	4,175	1,342
INCOME/ACRE FROM PRODUCTION		0	0	675
NET CASH COSTS/ACRE FOR THE YEAR		2,611	4,175	667
PROFIT/ACRE ABOVE CASH COSTS		0	0	0
ACCUMULATED NET CASH COSTS/ACRE		2,611	6,786	7,453

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Table 1. continued

	Cost Per Acre			
	Year:	1st	2nd	3rd
Tons Per Acre Fresh:		0	0	9.0
Capital Recovery Cost:				
Land		374	374	374
Irrigation System		60	60	60
Shop Building		34	34	34
Shop Tools		8	8	8
Fuel Tank & Pump		2	2	2
Equipment		33	37	56
TOTAL CAPITAL RECOVERY COST		511	515	534
TOTAL COST/ACRE FOR THE YEAR		3,122	4,690	1,876
INCOME/ACRE FROM PRODUCTION		0	0	675
TOTAL NET COST/ACRE FOR THE YEAR		3,122	4,690	1,201
NET PROFIT/ACRE ABOVE TOTAL COST		0	0	0
TOTAL ACCUMULATED NET COST/ACRE		3,122	7,812	9,013

UC COOPERATIVE EXTENSION
Table 2. COSTS PER ACRE TO PRODUCE RAISINS - DOV
 SAN JOAQUIN VALLEY - 2003

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:								
Prune	17.50	193	0	0	0	193		
Tie canes	8.00	88	0	0	0	88		
Shoot Thin/Trunk Sucker	3.00	33	0	0	0	33		
Renewal Fruit Removal	6.00	66	0	0	0	66		
Shoot Positioning	7.00	77	0	0	0	77		
Irrigate	0.10	1	0	7	0	9		
Fertilize	0.25	3	0	7	0	9		
Weed-Spot Spray 20% acres	0.49	7	1	9	0	17		
Weed-Disc	0.43	7	4	0	0	10		
Insect(worm)/Disease(mildew)/Fertilizer(Zn)	0.20	3	2	25	0	30		
Insect-Leaf Hopper	0.20	3	2	23	0	28		
Disease-Mildew	1.13	17	10	16	0	44		
Pickup Truck Use	2.38	36	15	0	0	51		
ATV 4WD	1.56	24	3	0	0	26		
TOTAL CULTURAL COSTS	50.81	586	37	201	0	825		
Harvest:								
Harvest-Sever Canes	7.25	80	0	0	0	80		
Harvest- Mechanical	0.65	17	9	0	0	26		
Bin Handling	0.66	17	3	0	114	134		
Bin Handling - Haul	0.63	10	4	0	0	13		
TOTAL HARVEST COSTS	9.19	124	16	0	114	253		
Postharvest:								
Severed Cane Removal	11.00	121	0	0	0	121		
Shred Canes	0.17	3	2	0	0	5		
TOTAL POSTHARVEST COSTS	11.17	124	2	0	0	126		
Assessment:								
Assessments	0.00	0	0	88	0	88		
TOTAL ASSESSMENT COSTS	0.00	0	0	88	0	88		
Interest on operating capital @ 7.14%						30		
TOTAL OPERATING COSTS/ACRE		835	52	291	114	1,322		
CASH OVERHEAD:								
Office Expense						75		
Liability Insurance						5		
Sanitation						12		
Property Taxes						112		
Property Insurance						35		
Investment Repairs						26		
TOTAL CASH OVERHEAD COSTS						264		
TOTAL CASH COSTS/ACRE						1,586		
NON-CASH OVERHEAD:								
		Per producing Acre		-- Annual Cost -- Capital Recovery				
Land		5,987		374		374		
Irrigation System		800		60		60		
Building		387		34		34		
Tools-Shop/Field		77		8		8		
Fuel Tanks		23		2		2		
Vineyard Establishment s		7,453		578		578		
Equipment		1,327		165		165		
TOTAL NON-CASH OVERHEAD COSTS		16,054		1,221		1,221		
TOTAL COSTS/ACRE						2,808		

UC COOPERATIVE EXTENSION
Table 3. COSTS AND RETURNS to PRODUCE RAISINS - DOV
 SAN JOAQUIN VALLEY - 2003

	Quantity/ Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Raisins	5.00	ton	600.00	3,000	
OPERATING COSTS					
Water:					
Water Pumped	36.00	acin	3.36	121	
Fertilizer:					
UN 32	25.00	lbN	0.31	8	
Neutral Zinc 52%	5.00	lb	0.80	4	
Herbicide:					
Roundup Ultra Max	1.50	pint	6.06	9	
Insecticide:					
Cryolite	6.00	lb	2.00	12	
Provado Solupak	0.75	oz	31.25	23	
Fungicide:					
Rubigan EC	8.00	floz	2.34	19	
Wettable Sulfur	3.00	lb	0.75	2	
Sulfur Dust	30.00	lb	0.16	5	
Rent:					
Bins	5.00	ton	21.00	105	
Forklift	2.00	wk/ac	4.68	9	
Assessment:					
Raisin Marketing Board	5.00	ton	17.50	88	
Labor (machine)	10.19	hrs	12.74	130	
Labor (non-machine)	63.99	hrs	11.02	705	
Fuel - Gas	7.30	gal	1.58	12	
Fuel - Diesel	13.80	gal	1.11	15	
Lube				4	
Machinery repair				21	
Interest on operating capital @ 7.14%				30	
TOTAL OPERATING COSTS/ACRE				1,322	
NET RETURNS ABOVE OPERATING COSTS				1,678	
CASH OVERHEAD COSTS:					
Office Expense				75	
Liability Insurance				5	
Sanitation				12	
Property Taxes				112	
Property Insurance				35	
Investment Repairs				26	
TOTAL CASH OVERHEAD COSTS/ACRE				264	
TOTAL CASH COSTS/ACRE				1,586	
NON-CASH OVERHEAD COSTS (Capital Recovery)					
Land				374	
Irrigation System				60	
Building				34	
Tools-Shop/Field				8	
Fuel Tanks				2	
Vineyard Establishment				578	
Equipment				165	
TOTAL NON-CASH OVERHEAD COSTS/ACRE				1,221	
TOTAL COSTS/ACRE				2,808	
NET RETURNS ABOVE TOTAL COSTS				192	

UC COOPERATIVE EXTENSION
Table 4. MONTHLY CASH to PRODUCE RAISINS
 SAN JOAQUIN VALLEY - 2003

Beginning JAN 03	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	TOTAL
Ending DEC 03	03	03	03	03	03	03	03	03	03	03	03	03	
Cultural:													
Prune-Cut Back	193												193
Tie canes		88											88
Shoot Thin				33									33
Renewal Fruit Removal					66								66
Shoot Positioning					77								77
Irrigate				12	15	29	36	29	19	13			152
Fertilize				2	2	2	2	2					9
Weed-Spot Spray 20% acres			6	6				6					17
Weed-Disc			5		5								10
Insect/Disease/Fertilizer					30								30
Insect-Leaf Hopper							28						28
Disease-Mildew				22		22							44
Pickup Truck Use	4	4	4	4	4	4	4	4	4	4	4	4	51
ATV 4WD	2	2	2	2	2	2	2	2	2	2	2	2	26
TOTAL CULTURAL COSTS	199	105	6	81	201	59	72	43	25	19	6	6	825
Harvest:													
Harvest-Cut Canes								80					80
Harvest- Mechanical									26				26
Bin Handling									134				134
Bin Handling-Haul									13				13
TOTAL HARVEST COSTS								80	173				254
Postharvest:													
Severed Cane Removal										121			121
Shred Canes										5			5
TOTAL POSTHARVEST COSTS										126			126
Assessment:													
Assessments									88				88
TOTAL ASSESSMENT COSTS									88				88
Interest on operating capital	1	2	2	2	4	4	4	5	6	-1	0	0	30
TOTAL OPERATING COSTS/ACRE	201	107	8	85	204	60	75	126	298	144	6	6	1,322
OVERHEAD:													
Office Expense	6	6	6	6	6	6	6	6	6	6	6	6	75
Liability Insurance	5												5
Sanitation	1	1	1	1	1	1	1	1	1	1			12
Property Taxes	56						56						112
Property Insurance	18						18						35
Investment Repairs	2	2	2	2	2	2	2	2	2	2	2	2	26
TOTAL CASH OVERHEAD COSTS	88	10	10	10	10	10	83	10	10	10	8	8	264
TOTAL CASH COSTS/ACRE	288	117	18	95	213	70	158	136	307	154	15	15	1,586

UC COOPERATIVE EXTENSION
Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT,
 SAN JOAQUIN VALLEY - 2003

ANNUAL EQUIPMENT COSTS

YrDescription	Price	Yrs Life	Salvage Value	Capital Recovery	Cash Overhead			Total
					Insur- ance	Taxes		
0372HP 2WD JD6210L Tractor	33,265	15	6,476	3,208	134	199		3,541
03ATV 4WD	6,700	5	3,003	1,071	33	49		1,153
03Brush Shredder 6'	9,000	15	864	905	33	49		988
03Disc - Tandem 8'	6,800	10	1,203	845	27	40		912
03Duster - 3 Pt	5,000	5	1,629	908	22	33		963
03 Forklift Field Lift	19,500	15	3,796	1,881	79	116		2,076
03Harvester Kilby/Coe	101,888	10	19,219	12,567	409	606		13,581
03Orchard/VineSprayer 500 Gal	20,378	5	6,638	3,699	91	135		3,925
03Pickup Truck 1/2 Ton	26,000	7	9,863	3,533	121	179		3,833
03 Truck Flatbed 20' 2 Ton	49,803	10	14,711	5,744	218	323		6,285
03Sprayer ATV 20 gal	350	10	62	43	1	2		47
TOTAL	278,684		67,464	34,404	1,168	1,731		37,304
60% of New Cost *	167,210		40,478	20,642	702	1,038		22,383

*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	60,000	20		5,338	203	300	1,200	7,041
Drip Irrigation System	64,000	30		4,775	216	320	1,280	6,591
Vineyard Establishment	596,240	27		46,268	2,015	2,981	0	51,265
Fuel Tanks 2-250 Gal	3,500	30	350	257	13	19	70	359
Land	928,000	30	928,000	58,000	0	9,280	0	67,280
Tools-Shop/Field	12,000	15	1,133	1,208	44	66	240	1,558
TOTAL INVESTMENT	1,663,740		929,483	115,846	2,491	12,966	2,790	134,094

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	155	acre	4.61	715
Office Expense	160	acre	75.00	12,000
Sanitation Fee	155	acre	12.85	1,900

UC COOPERATIVE EXTENSION
Table 6. HOURLY EQUIPMENT COSTS
 SAN JOAQUIN VALLEY - 2003

YrDescription	COSTS PER HOUR							Total Costs/Hr.
	Actual Hours Used	Capital Recovery	Cash Overhead		Operating			
			Insur- ance	Taxes	Repairs	Fuel & Lube	Total Oper.	
03 72HP 2WD JD6210L Tractor	376.90	5.11	0.21	0.32	1.43	4.51	5.94	11.58
03 ATV 4WD	315.10	2.04	0.06	0.09	0.50	1.21	1.71	3.90
03 Brush Shredder 6'	27.80	19.57	0.72	1.07	4.03	0.00	4.03	25.39
03 Disc - Tandem 8'	68.40	7.41	0.24	0.35	1.10	0.00	1.10	9.10
03 Duster - 3 Pt	119.00	4.57	0.11	0.17	0.73	0.00	0.73	5.58
03 Forklift Field Lift	192.10	5.87	0.25	0.36	0.23	3.39	3.62	10.11
03 Harvester Kilby OH Raisins	57.60	130.81	4.26	6.30	7.33	5.33	12.66	154.03
03 Orchard/VineSprayer 500 Gal	125.70	17.65	0.44	0.64	2.95	0.00	2.92	21.69
03 Pickup Truck 1/2 Ton	380.00	5.58	0.19	0.28	1.91	4.54	6.45	12.50
03 Truck Flatbed 20' 2 Ton	150.00	22.98	0.87	1.29	4.75	1.28	6.06	31.17
03 Sprayer ATV 20 gal	91.10	0.29	0.01	0.01	0.10	0.00	0.10	0.40

UC COOPERATIVE EXTENSION
Table 7. RANGING ANALYSIS
 SAN JOAQUIN VALLEY - 2003

COSTS PER ACRE AT VARYING YIELD TO PRODUCE RAISINS

	YIELD (ton/acre)						
	3.50	4.00	4.50	5.00	5.50	6.00	6.50
OPERATING COSTS:							
Cultural Cost	825	825	825	825	825	825	825
Harvest Cost	211	226	240	254	268	282	297
Assessment Cost	61	70	79	88	96	105	114
Postharvest Cost	126	126	126	126	126	126	126
Interest on operating capital	29	29	29	30	30	30	30
TOTAL OPERATING COSTS/ACRE	1,252	1,276	1,299	1,323	1,345	1,368	1,392
Total Operating Costs/ton	358	319	289	265	245	228	214
CASH OVERHEAD COSTS/ACRE	264	264	264	264	264	265	265
TOTAL CASH COSTS/ACRE	1,516	1,540	1,563	1,587	1,609	1,633	1,657
Total Cash Costs/ton	433	385	347	317	293	272	255
NON-CASH OVERHEAD COSTS/ACRE	1,219	1,220	1,221	1,221	1,222	1,223	1,223
TOTAL COSTS/ACRE	2,735	2,760	2,784	2,808	2,831	2,856	2,880
Total Costs/ton	782	690	619	562	515	476	443

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR RAISINS

PRICE \$/ton	YIELD (ton/acre)						
	3.50	4.00	4.50	5.00	5.50	6.00	6.50
600.00	848	1,124	1,401	1,678	1,955	2,232	2,508
700.00	1,198	1,524	1,851	2,178	2,505	2,832	3,158
800.00	1,548	1,924	2,301	2,678	3,055	3,432	3,808
900.00	1,898	2,324	2,751	3,178	3,605	4,032	4,458
1,000.00	2,248	2,724	3,201	3,678	4,155	4,632	5,108
1,100.00	2,598	3,124	3,651	4,178	4,705	5,232	5,758
1,200.00	2,948	3,524	4,101	4,678	5,255	5,832	6,408

NET RETURN PER ACRE ABOVE CASH COST FOR RAISINS

PRICE \$/ton	YIELD (ton/acre)						
	3.50	4.00	4.50	5.00	5.50	6.00	6.50
600.00	584	860	1,137	1,414	1,691	1,967	2,243
700.00	934	1,260	1,587	1,914	2,241	2,567	2,893
800.00	1,284	1,660	2,037	2,414	2,791	3,167	3,543
900.00	1,634	2,060	2,487	2,914	3,341	3,767	4,193
1,000.00	1,984	2,460	2,937	3,414	3,891	4,367	4,843
1,100.00	2,334	2,860	3,387	3,914	4,441	4,967	5,493
1,200.00	2,684	3,260	3,837	4,414	4,991	5,567	6,143

NET RETURNS PER ACRE ABOVE TOTAL COST FOR RAISINS

PRICE \$/ton	YIELD (ton/acre)						
	3.50	4.00	4.50	5.00	5.50	6.00	6.50
600.00	-635	-360	-84	193	469	744	1,020
700.00	-285	40	366	693	1,019	1,344	1,670
800.00	65	440	816	1,193	1,569	1,944	2,320
900.00	415	840	1,266	1,693	2,119	2,544	2,970
1,000.00	765	1,240	1,716	2,193	2,669	3,144	3,620
1,100.00	1,115	1,640	2,166	2,693	3,219	3,744	4,270
1,200.00	1,465	2,040	2,616	3,193	3,769	4,344	4,920