1998

UNIVERSITY OF CALIFORNIA - COOPERATIVE EXTENSION
SAMPLE COSTS
TO ESTABLISH A VINEYARD AND PRODUCE
~ *TABLE GRAPES*_

SAN JOAQUIN VALLEY
THOMPSON SEEDLESS VARIETY

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Thompson Seedless Variety, San Joaquin Valley

INTRODUCTION

The detailed costs for vineyard establishment and table grape production in the San Joaquin Valley are presented in this study. The hypothetical farm used in this report consists of a total of 120 acres, 75 acres of table grape producing acres, 40 acres are being established to grapes, and 5 acres are in farmstead, roads, and pumping stations.

This study consists of Assumptions to Establish a Vineyard and Produce Table Grapes and eight tables. It is intended as a guide only. It can assist in production decisions, determining potential returns, and prepare budgets. Sample costs given for labor, materials, equipment and contract services are based on current figures. Some costs and practices detailed in this study may not be applicable to every situation. A blank, *Your Cost,* column is provided to enter your actual costs on Table 2 Costs Per Acre To Produce Table Grapes and Table 3 Costs And Returns Per Acre to Produce Table Grapes.

Tables included:

This and other studies can be obtained through the Department of Agricultural and Resource Economics, U.C. Davis (530-752-1515), or from selected county Cooperative Extension offices. For an explanation of calculations or assumptions used in this study refer to the attached General Assumptions or call the Department of Agricultural Economics, Cooperative Extension, University of California, Davis, California, (530-752-3589) or the farm advisor in the county of interest.

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ASSUMPTIONS

The following assumptions pertain to sample costs of establishing a Thompson Seedless vineyard and producing table grapes in the San Joaquin Valley. Practices described are not recommendations by the University of California, but represent production procedures and materials considered typical of a well managed vineyard for the San Joaquin Valley. Costs and practices detailed in this study may not be applicable to all situations. Establishment and cultural practices vary by grower and region; variations can be significant. These costs are on an annual, per acre basis. **The use of trade names 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.**

Land. The table grape vineyard is owned, managed, and operated by the grower. The vineyard is located in the San Joaquin Valley and is situated on previously farmed land. The vineyard is comprised of 120 acres, 75 of which are producing table grapes, and 40 acres of table grape grapes being established. The other 5 acres are occupied by roads, irrigation systems, and farmstead. Land is valued at $4,500 per acre. This study assumes the land was purchased. Because only 115 of the 120 acres are planted to grapes, land is valued at $4,696 per planted acre.

Vines. Grape vines are planted on a 8' x 12' spacing with 454 vines per acre during the first spring. In the second year 20 vines per acre are replanted for those lost in the first year. Vines will be 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. The trellis system is installed by a contract company in the second year. The trellis system is considered part of the vineyard and would be removed at the time of vine removal, and thus shown in the vineyard establishment costs in Table 1. The following details the trellis system installation.

Second Year Eight-foot wooden end posts are placed at each row end. In between the end posts an eight-foot lodgepole is driven into the ground every 24 feet. The lodgepole posts will have a 42 inch crossarm attached and braced to support the four 13 gauge foliage wires. A bamboo stake is placed at each vine for training the trunk.

Irrigation System. Since the vineyard is established on land previously planted to vineyards/orchards, it is assumed to have a well which will be refurbished and a new pump motor will be installed prior to planting. The well, 40 hp motor, pump, filtration station, fertilizer tank and injector system, mainlines, valves, and the labor to renovate and install these components is included in the irrigation system cost. The irrigation system is considered an improvement to the property and has a 25 year life. Therefore, it is included in the non-cash overhead sections as capital recovery cost of various tables and the Investments portion of Table 5.

Water plus labor constitute the irrigation cost. In this study, water is calculated to cost $5.63 per acre-inch or $67.56 per acre-foot. The cost results from a mix of pumped and district water. The pumping cost is based on using 40 hp motor to pump from 130 feet deep over 120 acres. District water costs range from $13 to $50 per acre-foot or per acre. 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.

Irrigations occur during the growing season from March through August and in production years includes a September postharvest irrigation. The drip irrigation lines are laid directly on the ground prior to planting. Nitrogen fertilizer is injected at the pump and flowsinto the drip line starting the first year. The amount of water applied to the vines varies through the establishment years and are shown in Table A.

Table A. Applied Irrigation Water

Year	Number of Months	AcIn/Year
1	7	8
2	7	18
3+	7	30

ESTABLISHMENT CULTURAL PRACTICES

This vineyard is established on ground that had previously been planted to vineyards or orchards. The land is assumed to be fairly level. The practices described below represents only the hypothetical vineyard in this study and may not be appropriate to your circumstance.

Site Preparation. The land is subsoiled twice to a depth of 4-5 feet breaking up any underlying hardpan to improve root and water penetration. Afterwards the ground is disced twice to break up large clods of soil smoothing the ground in advance of leveling. Leveling consists of three passes with a landplane. The bare ground is fumigated with methyl bromide at 400 pounds per acre, untarped, to control soil nematodes and pathogens. All of the land preparation operations are contracted out to commercial companies. Most operations that prepare the vineyard for planting are done in the year prior to planting, but costs are shown in the first year, but costs are shown in the first year in Table 1.

Planting. Plants are dormant, bench-grafted rootstock vines purchased from a commercial nursery. Planting the vineyard starts by laying out and marking vine sites in early spring. Holes are dug and vines are planted is placed around the vine. During the spring a postplant, pre-emergent, residual herbicide is applied for weed control through most of the first year growing season. In the second year, 20 vines per acre are replaced.

Pruning and Training. Dormant pruning begins the second year. Training includes suckering, tying, and training the selected cordons and spurs. 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 only through the third year and requires a portion of the labor-hours the second year needed. Suckering and retying require the majority of the time involved and continue throughout the life of the vineyard.

Insect and Arthropod Management. Insects and mites are managed by using pesticides and management techniques beginning the first year. Pest populations are monitored to determine when an economically damaging level will occur and which control method to use. From the second year on an insecticide

is sprayed to manage grapeleaf skeletonizer. In the third year another treatment is made in July to control leafhoppers.

Disease Management. There are many pathogens that attack grapevines, but the only major disease that is treated in this study is powdery mildew. A dusting and spraying program for powdery mildew control begins the third year with four applications of sulfur dust and increases to nine after the third year. Also in the third year, two wettable sulfur treatments are made with one mixed in the spray to control grape leaf skeletonizer. A sterol inhibitor (SI) is applied for additional mildew control in beginning in the third year. All applications are made using a 75 horsepower (hp) tractor and an orchard sprayer.

Vineyard Floor Management. Weed control in the vine row and middles are managed with multiple discings, mowing, and herbicides. In the first year the row middles are disced twice and mowed twice from March through July. During the second year the middles are mowed four times and three times in the third year. The vine rows are stripped sprayed with pre-emergent herbicides during winter each year. The strip spray is applied on only 30 percent of the acreage. Beginning the second year escaped weeds are treated with a spot spray of contact herbicide.

Fertilization. A liquid nitrogen fertilizer is injected into the irrigation system beginning in the first year at five pounds of N per acre. The amount of nitrogen applied each year increases and is shown in Table B.

Table B. Applied Nitrogen Per Acre

Year	Pounds of N
1	0
2	20
3	40
4+	50

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 $5,256 per acre or $394,200 for the 75 producing acres. The establishment cost is spread over the remaining 22 years of the 25 years the vineyard is in production.

PRODUCTION CULTURAL PRACTICES

Canopy and Fruit Management. Pruning is done during the winter months and the prunings are placed in the row middles and shredded. Suckers and sterile shoots are removed from the vine trunks and crowns during April. Fruit management practices are used to increase fruit size. In this study these practices consist of flower or berry thinning, girdling, and application of a growth regulator. Hand thinning is used to adjust berry set, cluster length, and crop load in late May and early June. Girdling is performed in May to increase berry size. The growth regulator, gibberellic acid (GA), is applied four times for both bloom thinning (twice) and berry sizing (twice) in May. All foliar applied sprays are made using the 75 hp tractor and 500 gallon vineyard sprayer.

Vineyard Floor Management. Herbicides and mowing are use to manage the vineyard floor and control weeds. Vineyard floors are mowed four times in March through August. Vine row weeds are controlled with a pre-emergent herbicide mix applied as a strip spray during the winter. Escaped weeds are treated with a spot spray of a contact herbicide during the summer.

Insect And Disease Management. Pest management techniques used to control insect problems in the last year of vineyard establishment are the same practices used in the production years. Grapeleaf skeletonizer is treated with an insecticide mixed with GA in the first bloom spray in May. The second bloom spray (also in May) includes an insecticide to control leafhoppers.

Disease management consists of various treatments for powdery mildew. The first mildew treatment is in March with an application of wettable sulfur and fixed copper. Copper is included as an early-season phomopsis control measure. Sulfur dust is applied four times in April and five more times from June through harvest for a total of nine times. Mixed in with the May bloom and berry set sprays are a sterol inhibitor (SI) and wettable sulfur. Wettable sulfur and SI are used alternately in the bloom and berry set applications. All of the insect and fungicide sprays are made using a 75 hp tractor and orchard sprayer.

Fertilization. 50 pounds per acre of a liquid nitrogen fertilizer is added to the irrigation water in May. Neutral zinc is applied to prevent zinc deficiencies and is combined with one of the April sulfur dust applications.

Pesticides, rates, and cultural practices mentioned in this cost study are a few of those listed in the *UC IPM Pest Management Guidelines, Grapes* and *Grape Pest Management.* Written recommendations are required for many pesticides and are made by licensed pest control advisors. For information and pesticide use permits, contact the local county Agricultural Commissioner's office. For additional production information contact one of the San Joaquin Valley viticulture farm advisors.

Harvest. Harvesting begins the third year. In the third year the grapes are picked for wine production for a contracted rate of $45 per ton. Hauling the table grapes to the processor is included in the $45 per ton cost. Beginning in the fourth year, the Thompson Seedless are harvested for table grapes. They are picked and field packed for $2.00 per box. The box holds 21 pounds of fruit and costs $2.00 each. The labor to spread the boxes in the vineyard and remove them from the field and haul to the buyer costs $0.35 per box. The cost of the selling commission, cold storage, fumigation, and packing are not included in this study. All harvest operations are contract services.

Assessments. There are no assessments when the grapes are sold for wine. However, when the fruit is sold as table grapes each box is charge an assessment by the California Table Grape Commission (CTGC). Currently the CTGC assessment rate is $0.12 per box. Table grapes are inspected for quality control and charged an additional $0.025 per box. Typically, one-third of the yield is inspected.

Yields. Table grapes begin bearing an economic crop in the third year after planting. A yield of 6 ton per acre is used in the third year and is processed into wine. This study uses a yield of 700 21-pound boxes to calculate returns. Average yields for the last five years are shown in Table C.

Table C. Yield of Thompson Seedless Table Grapes

Year	Boxes Per Acre
1993	950
1994	750
1995	940
1996	835
1997	919

Source: Fresno County Crop Reports, 1994-1997.

Returns. Use of return prices for grapes is for calculating net returns to growers at different yields and price. Returns shown in Table 7 vary and yields and prices used in this cost study are an estimate. An estimated price of $10 per box of Thompson Seedless grapes is used in this study. Average return prices for the last five years are shown in Table C.

Risk. Risk occurs because of production, price, and financial uncertainty. Examples include disease damage, a decrease in price, and an increase in interest rates. The risks associated with producing table grapes in the San Joaquin Valley should not be underestimated.

While this study makes every effort to model a production system based on typical, commercial practices, it cannot fully represent agronomic, market, and financial risks which affect the profitability and economic viability of table grape production. Additionally, establishment of vineyards and the equipment required to properly handle the fruit is very capital intensive. Growers should consider all of the agronomic and economic risks before committing resources to establishing a vineyard and table grape production in this region.

Labor. Hourly wages for workers are $7.00 and $6.00 per hour for machine and non-machine workers, respectively. Adding 34% for Workers Compensation, Social Security, Medicare, insurance, and other possible benefits gives the labor rates shown of $9.38 and $8.04 per hour for machine labor and non-machine labor, respectively.

Labor time 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. Wages for a manager are not included as cost. Returns above total costs is considered a return to management.

Cash Overhead. Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm, not to a particular operation. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, and repairs for buildings and irrigation equipment.

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.

Interest On Operating Capital. Interest on operating capital is based on cash operating costs and is calculated monthly until harvest at a nominal rate of 10.46% per year. The assumed postharvest operations are discounted back to the harvest month at the same interest rate so that all costs are adjusted to the same position in time.

Insurance. Insurance for farm investments vary depending on the assets included and the amount of coverage. Property insurance provides coverage for property loss and is charged at 0.713% of the average value of the assets over their useful life. Liability insurance covers accidents on the farm and costs $511 for the entire farm.

Office Expense. Office and business expenses for 120 acres are estimated at $4,500 annually or $38 per planted acre. These expenses include office supplies, telephones, bookkeeping, accounting, legal fees, road maintenance, etc.

Sanitation Services. Sanitation services provide portable toilets for the vineyard and cost the farm $110 annually. This cost includes delivery and regular servicing of toilets.

Non-cash Overhead. Non-cash overhead is calculated as the capital recovery cost for equipment and other farm investments. Although farm equipment used on vineyards in the San Joaquin Valley may be purchased new or used, this study (Table 6) 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 (Equipment and Investments) are shown in Tables 1, 2, 3 and 5. They represent the capital recovery cost for investments on an annual per acre basis.

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). Put another way, it is equivalent to the annual payment on a loan for the investment with the downpayment 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 calculation for the annual capital recovery costs is as follows. The calculation for the annual capital recovery costs is taken from the publication *Farm Management* (Boehlje and Eidman) and is as follows.

$$\left(\text{Purchase Price} - \text{Salvage Value}\right) \times \text{Capital Recovery Factor} + \text{Salvage Value} \times \text{Interest Rate}$$

Salvage Value. Salvage value is an estimate of the remaining market value of an investment at the end of its useful life. It is calculated differently for different investments. For farm machinery (e.g., tractors and implements) the remaining value is a percentage of the new cost of the investment. Salvage value is calculated as

$$\textit{New Price} \times \textit{\% Remaining Value}$$

Salvage value for other investments including irrigation systems, buildings, and miscellaneous equipment is zero. The salvage value for land is equal to the purchase price because land does not depreciate from use. The purchase price and salvage value for certain equipment and investments are shown in Table 4.

Capital Recovery Factor. Capital recovery factor is the amortization factor or annual payment whose present value at compound interest is 1. It is the function of the interest rate and years of life of the equipment.

Interest Rate. The interest rate of 7.81% used to calculate capital recovery cost is the United States Department of Agriculture-Economic Reporting Service's (USDA-ERS) ten year average of California's agricultural sector long-run real 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, not including inflation. In other words, the next best alternative use for these resources is in another agricultural enterprise.

Equipment Costs. Cash 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 fuel, lubrication, and repairs.

Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the ASAE. Fuel and lubrication costs are also determined by ASAE equations based on maximum PTO hp, and type of fuel used. The fuel 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 cultural practice by the number of hours per acre for that operation. Tractor time is 10% higher than implement time for a given operation to account for setup time. Prices for on-farm delivery of diesel and gasoline are $0.78 and $1.22 per gallon, respectively.

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U.C. COOPERATIVE EXTENSION

Table 1. SAMPLE COSTS PER ACRE TO ESTABLISH A TABLE GRAPE VINEYARD
SAN JOAQUIN VALLEY - 1998
THOMPSON SEEDLESS

Labor Rate: $9.38/hr. machine labor
$8.04/hr. non-machine labor

Vines Per Acre: 454
Interest Rate: 10%

	Cost Per Acre		
Year	1st	2nd	3rd
Tons Per Acre			6.0
Planting Costs:			
Land Preparation - Subsoil 2X	$250		
Land Preparation - Disc 2X	50		
Land Preparation - Level	80		
Land Preparation - Fumigate	550		
Survey & Layout Vineyard	140		
Plant Vines: 454 Per Acre (2% Replant In 2nd Year)	1,362	$64	
Install Trellis System		2,078	
TOTAL PLANTING COSTS	2,432	2,142	
Cultural Costs:			
Prune & Tie - Dormant		47	$101
Brush Disposal			9
Fertilize		8	16
Irrigate	85	142	209
Pest Control - Vertebrates	25	10	10
Disease Control - Phomopsis			39
Training (Sucker, Tie & Train)		193	80
Weed Control - Disc Middle - Year 1: 2X & Year 2+: 1X	7	7	7
Weed Control - Mow Middle - Year 1: 2X & Year 2+: 4X	6	13	13
Weed Control - Hand Hoe	24		
Pest Control - Grapeleaf Skeletonizer & Mildew Control		23	22
Disease Control – Mildew - Wettable Sulfur			9
Insect Control - Leafhoppers 2X			29
Disease Control - Mildew - SI			59
Disease Control - Sulfur Dust Applications 5X			20
Weed Control - Spot Spray			22
Weed Control - Winter Strip Spray	13	31	31
Miscellaneous Costs	50	50	50
Pickup Truck Use	36	36	36
TOTAL CULTURAL COSTS	246	560	762
Harvest Costs:			
Harvest - Contract			270
TOTAL HARVEST COSTS			270
Interest On Operating Capital @ 10%	131	137	37
TOTAL OPERATING COSTS/ACRE	2,809	2,839	1,069

	Cost Per Acre		
Year	1st	2nd	3rd
Tons Per Acre			6.0
Cash Overhead Costs:			
Office Expense	38	38	38
Liability Insurance	4	4	4
Property Taxes	55	56	57
Property Insurance	39	40	41
Investment Repairs	25	25	25
TOTAL CASH OVERHEAD COSTS	161	163	165
TOTAL CASH COSTS/ACRE	2,970	3,002	1,234
INCOME/ACRE FROM PRODUCTION			1,950
NET CASH COSTS/ACRE FOR THE YEAR	2,970	3,002	
PROFIT/ACRE ABOVE CASH COSTS			716
ACCUMULATED NET CASH COSTS/ACRE	2,970	5,972	**5,256**
Capital Recovery Cost:			
Land @ $4,500	367	367	367
Furrow Irrigation System	98	98	98
Shop Building	13	13	13
Shop Tools	9	9	9
Fuel Tank & Pump	5	5	5
Equipment	20	24	58
TOTAL CAPITAL RECOVERY COST	512	516	550
TOTAL COST/ACRE FOR THE YEAR	3,482	3,518	1,784
INCOME/ACRE FROM PRODUCTION	0	0	1,950
TOTAL NET COST/ACRE FOR THE YEAR	3,482	3,518	0
NET PROFIT/ACRE ABOVE TOTAL COST	0	0	166
TOTAL ACCUMULATED NET COST/ACRE	3,482	7,000	6,834

Table 2.

U.C. COOPERATIVE EXTENSION
COSTS PER ACRE TO PRODUCE TABLE GRAPE
SAN JOAQUIN VALLEY - 1998
THOMPSON SEEDLESS

Labor Rate: $9.38/hr. machine labor
$8.04/hr. non-machine labor
Interest Rate: 10.46%
Yield per Acre: 700 Box

Operation	Time (Hrs/A)	Cash and Labor Costs per Acre: Labor Cost	Fuel,Lube & Repairs	Material Cost	Custom/ Rent	Total Cost	Your Cost
Cultural:							
Prune Vines	35.00	281	0	0	0	281	
Brush Disposal (Every Middle)	0.60	7	3	0	0	10	
Tie Vines	0.00	0	0	5	68	73	
Disease Control - Phomopsis/Mildew 2X	0.38	4	3	34	0	41	
Insect Control - Mealybug	0.38	4	3	29	0	36	
Weed Control - Winter Strip	0.25	3	1	23	0	27	
Weed Control - Mow Middles 4X	0.80	9	4	0	0	13	
Irrigate	5.00	40	0	203	0	243	
Disease Control- Phomopsis	0.38	4	3	10	0	17	
Mildew Control - Dust Sulfur 12 X	1.33	15	6	14	0	35	
Remove Trunk Suckers	0.00	0	0	0	35	35	
Canopy Management - Shoot Thin, Crown Sucker, Leaf Removal, & Lift Canes	0.00	0	0	0	150	150	
Fertilize	0.00	0	0	20	0	20	
Berry Thin 2X, Disease & Insect Control	0.76	9	6	107	0	121	
Fruit Management Berry Thin, Cluster Tip, Adjust Crop Load	73.00	587	0	0	0	587	
Berry Size 2X, Disease & Insect Control	0.76	9	6	154	0	168	
Girdling	10.00	80	0	0	0	80	
Weed Control - Spot Spray	0.25	3	1	18	0	22	
Sulfur Application 12X	1.67	19	7	16	0	42	
Pest Control - Vertebrate Pest	0.00	0	0	10	0	10	
Miscellaneous Costs	1.00	46	4	0	0	50	
Pickup Truck Use	2.44	27	9	0	0	37	
TOTAL CULTURAL COSTS	134.01	1147	55	644	253	2100	
Harvest:							
Pick, Pack & Supervise	0.00	0	0	1400	0	1400	
Box, Spread, Swamp & Haul	0.00	0	0	1645	0	1645	
TOTAL HARVEST COSTS	0.00	0	0	3045	0	3045	
Postharvest:							
Precool, Palletize & Store	0.00	0	0	175	0	175	
Table Grape Commission	0.00	0	0	84	0	84	
Quality Control Inspection	0.00	0	0	58	0	58	
TOTAL POSTHARVEST COSTS	0.00	0	0	317	0	317	
Interest on operating capital @ 10.46%						97	
TOTAL OPERATING COSTS/ACRE		1147	55	4006	253	5559	

Table 2. Continued

Operation			Total Cost
CASH OVERHEAD:			
Office Expense			39
Liability Insurance			4
Sanitation Service			1
Property Taxes			85
Property Insurance			60
Investment Repairs			25
TOTAL CASH OVERHEAD COSTS			214
TOTAL CASH COSTS/ACRE			5774
NON-CASH OVERHEAD:			
Investment	Per producing Acre	-- Annual Cost -- Capital Recovery (7.81% Interest Rate)	
Land	4696	367	367
Drip Irrigation System	1036	94	94
Buildings	150	13	13
Shop Tools	87	9	9
Fuel Tanks & Pump	52	5	5
Vineyard Establishment	5256	499	499
Equipment	645	81	81
TOTAL NON-CASH OVERHEAD COSTS	11921	1067	1067
TOTAL COSTS/ACRE			6841

U.C. COOPERATIVE EXTENSION

Table 3. COSTS AND RETURNS PER ACRE TO PRODUCE TABLE GRAPE
SAN JOAQUIN VALLEY - 1998
THOMPSON SEEDLESS

Labor Rate: $9.38/hr. machine labor
$8.04/hr. non-machine labor
Interest Rate: 10.46%

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS					
Table Grape	700.00	Box	10.00	7000	
TOTAL GROSS RETURNS FOR TABLE GRAP				7000	
OPERATING COSTS					
Miscellaneous:					
Vine Ties	1.00	Acre	5.00	5	
Contract:					
Tie Vines	454.00	Vine	0.15	68	
Suckering	1.00	Acre	35.00	35	
Canopy Management	3.00	Acre	50.00	150	
Fungicide:					
Kocide	2.50	Lb	2.24	6	
Microthial	5.00	Lb	0.75	4	
Captan 50WP	5.00	Lb	3.82	19	
Dithane M-45	4.00	Lb	4.06	16	
Dusting Sulfur	180.00	Lb	0.16	29	
Rally 40WP	12.00	Oz	4.55	55	
Wettable Sulfur	6.00	Lb	0.56	3	
Insecticide:					
Lorsban 4E	4.00	Pint	7.29	29	
Kryocide	6.00	Lb	2.36	14	
Provado	0.70	Lb	32.71	23	
Herbicide:					
Surflan	0.30	Gal	77.75	23	
Roundup	3.00	Pint	5.95	18	
Irrigation:					
Water	36.00	AcIn	5.63	203	
Fertilizer:					
Neutral Zinc	4.00	Lb	0.40	2	
UN-32	50.00	Lb N	0.41	20	
Growth Regulator:					
Gibberellin	144.00	Gram	1.15	166	
Rodenticide:					
Bird & Rodent Control	1.00	Acre	10.00	10	

Table 3. Continued

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
Harvest:					
Pick & Field Pack	700.00	Box	2.00	1400	
Boxes - 21 Lb	700.00	Box	2.00	1400	
Spread & Haul	700.00	Box	0.35	245	
Precool, Pallet & Store	700.00	Box	0.25	175	
Assessment:					
Table Grape Commission	700.00	Box	0.12	84	
Quality Control Inspect.	233.00	Box	0.25	58	
Labor (machine)	13.21	Hrs	9.38	124	
Labor (non-machine)	127.30	Hrs	8.04	1023	
Fuel - Gas	4.57	Gal	1.22	6	
Fuel - Diesel	26.80	Gal	0.78	21	
Lube				4	
Machinery repair				25	
Interest on operating capital @ 10.46%				97	

TOTAL OPERATING COSTS/ACRE				5559	
NET RETURNS ABOVE OPERATING COSTS				1441	
CASH OVERHEAD COSTS:					
Office Expense				39	
Liability Insurance				4	
Sanitation Service				1	
Property Taxes				85	
Property Insurance				60	
Investment Repairs				25	

TOTAL CASH OVERHEAD COSTS/ACRE				214	
TOTAL CASH COSTS/ACRE				5774	
NON-CASH OVERHEAD COSTS (CAPITAL RECOVERY - 7.81% Interest Rate):					
Land				367	
Drip Irrigation System				94	
Buildings				13	
Shop Tools				9	
Fuel Tanks & Pump				5	
Vineyard Establishment				499	
Equipment				81	

TOTAL NON-CASH OVERHEAD COSTS/ACRE				1067	
TOTAL COSTS/ACRE				6841	
NET RETURNS ABOVE TOTAL COSTS				159	

Table 4. MONTHLY CASH COSTS PER ACRE TO PRODUCE TABLE GRAPE SAN JOAQUIN VALLEY - 1998 THOMPSON SEEDLESS

Beginning JAN 98 Ending DEC 98	JAN 98	FEB 98	MAR 98	APR 98	MAY 98	JUN 98	JUL 98	AUG 98	SEP 98	OCT 98	NOV 98	DEC 98	TOTAL
Cultural: Prune Vines	281												281
Brush Disposal		10											10
Tie Vines		73											73
Disease Control - Phomopsis			41										41
Insect Control - Mealybug			36										36
Weed Control - Winter Strip			27										27
Weed Control - Mow Middle			3	3		3	3						13
Irrigate			23	23	23	58	58	35	23				243
Disease Control- Phomopsis			17										17
Mildew Control - Dust Sulfur				10	17			8					35
Remove Trunk Suckers				35									35
Canopy Management				50	60		40						150
Fertilize				20									20
Berry Thin 2X, Disease & Insect Control					121								121
Fruit Management					297	289							587
Berry Size 2X, Disease & Insect Control					168								168
Girdling					80								80
Weed Control - Spot Spray						22							22
Sulfur Application 12X						17	25						42
Pest Control - Vertebrate							5	5					10
Miscellaneous Costs	4	4	4	4	4	4	4	4	4	4	4	4	50
Pickup Truck Use	3	3	3	3	3	3	3	3	3	3	3	3	37
TOTAL CULTURAL COSTS	289	90	156	149	774	396	138	55	30	7	7	7	2100
Harvest: Pick, Pack & Supervise									700	700			1400
Box, Spread, Swamp & Haul									823	823			1645
TOTAL HARVEST COSTS									1522	1522			3044
Postharvest:													
Precool, Palletize & Store									88	88			175
Table Grape Commission										84			84
Quality Control Inspection										58			58
TOTAL POSTHARVEST COSTS									88	230			318
Interest on oper. capital	3	3	5	6	13	16	17	18	32	-15			97
TOTAL OPERATING COSTS/ACRE	291	94	161	155	787	412	156	73	1673	1744	7	7	5559
OVERHEAD: Office Expense	3	3	3	3	3	3	3	3	3	3	3	3	39
Liability Insurance	4												4
Sanitation Service	0	0	0	0	0	0	0	0	0	0	0	0	1
Property Taxes	42						42						85
Property Insurance	30						30						60
Investment Repairs	2	2	2	2	2	2	2	2	2	2	2	2	25
TOTAL CASH OVERHEAD COSTS	82	5	5	5	5	5	78	5	5	5	5	5	214
TOTAL CASH COSTS/ACRE	373	99	166	161	792	418	233	78	1678	1750	13	12	5774

U.C. COOPERATIVE EXTENSION

Table 5. WHOLE FARM ANNUAL EQUIPMENT, INVESTMENT, AND BUSINESS OVERHEAD COSTS

SAN JOAQUIN VALLEY - 1998

THOMPSON SEEDLES

ANNUAL EQUIPMENT COSTS

Yr	Description	Price	Yrs Life	Salvage Value	Capital Recovery	- Cash Overhead - Insurance	Taxes	Total
98	50 HP 2WD Tractor	29923	12	7481	3533	133	187	3853
98	75 HP 2WD Tractor	33247	12	8312	3925	148	208	4281
98	Duster - 3 Pt	2520	16	214	274	10	14	297
98	Mower/Chopper - 8'	3672	10	649	497	15	22	534
98	Orchard Sprayer - 500 Gal	17746	10	3138	2403	74	104	2582
98	Pickup Truck - 1/2 Ton	16226	7	6155	2403	80	112	2594
98	Weed Sprayer - 100 Gal	2339	10	414	317	10	14	340
TOTAL		105673		26363	13353	471	660	14483
60% of New Cost *		63404		15818	8012	282	396	8690

* Used to reflect a mix of new and used equipment.

ANNUAL INVESTMENT COSTS

Description	Price	Yrs Life	Salvage Value	Capital Recovery	------ Cash Overhead ------ Insurance	Taxes	Repairs	Total
INVESTMENT								
Buildings	17200	30	1720	1485	67	95	344	1991
Drip Irrigation System	119150	25	11915	10814	467	655	2383	14319
Fuel Tanks & Pump	5985	25	599	543	23	33	60	660
Land	540000	25	540000	42174	3850	5400	0	51424
Shop Tools	10000	20	1000	982	39	55	100	1176
Vineyard Establishment	394200	23		37424	1405	1971	0	40801
TOTAL INVESTMENT	1086535		555234	93422	5853	8209	2887	110371

ANNUAL BUSINESS OVERHEAD COSTS

Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	120.00	Acre	4.25	510
Office Expense	120.00	Acre	37.50	4500
Sanitation Service	120.00	Acre	0.92	110

Table 6.

UC COOPERATIVE EXTENSION
HOURLY EQUIPMENT COSTS
SAN JOAQUIN VALLEY - 1998
THOMPSON SEEDLESS

Yr	Description	Actual† Hours Used	COSTS PER HOUR - Cash Overhead - Capital Recovery	Insurance	Taxes	Operating - Repairs	Fuel & Lube	Total Oper.	Total Costs/Hr.
98	50 HP 2WD Tractor	1021.7	2.07	0.08	0.11	1.28	2.20	3.48	5.75
98	75 HP 2WD Tractor	220.6	10.68	0.40	0.57	1.43	3.30	4.73	16.37
98	Duster - 3 Pt	225.0	0.73	0.03	0.04	0.38	0.00	0.38	1.18
98	Mower/Chopper - 8'	195.0	1.53	0.05	0.07	1.70	0.00	1.70	3.34
98	Orchard Sprayer - 500 Gal	200.5	7.19	0.22	0.31	2.17	0.00	2.17	9.90
98	Pickup Truck - 1/2 Ton	272.8	5.29	0.18	0.25	1.18	2.63	3.81	9.51
98	Weed Sprayer - 100 Gal	119.5	1.59	0.05	0.07	0.58	0.00	0.58	2.28

† Actual hours used equals the combined hours equipment is used for table grapes and other farm enterprises.

Table 7.

U.C. COOPERATIVE EXTENSION
RANGING ANALYSIS
SAN JOAQUIN VALLEY - 1998
THOMPSON SEEDLESS

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE TABLE GRAPES

	YIELD (BOX/ACRE) 400	500	600	700	800	900	1000
OPERATING COSTS/ACRE:							
Cultural Cost	2100	2100	2100	2100	2100	2100	2100
Harvest Cost	1996	2452	2907	3362	3818	4273	4728
Interest on operating capital	98	97	97	97	97	97	97
TOTAL OPERATING COSTS/ACRE	4194	4649	5104	5559	6015	6470	6925
TOTAL OPERATING COSTS/BOX	10.49	9.30	8.51	7.94	7.52	7.19	6.92
CASH OVERHEAD COSTS/ACRE	214	214	214	214	214	214	214
TOTAL CASH COSTS/ACRE	4408	4864	5319	5774	6229	6684	7139
TOTAL CASH COSTS/BOX	11.02	9.73	8.86	8.25	7.79	7.43	7.14
NON-CASH OVERHEAD COSTS/ACRE	1067	1067	1067	1067	1067	1067	1067
TOTAL COSTS/ACRE	5476	5931	6386	6841	7296	7752	8207
TOTAL COSTS/BOX	13.69	11.86	10.64	9.77	9.12	8.61	8.21

U.C. COOPERATIVE EXTENSION

Table 7. Continued

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR TABLE GRAPES

PRICE (DOLLARS/BOX)	YIELD (BOX/ACRE)						
Table Grapes	400	500	600	700	800	900	1000
7.00	-1394	-1149	-904	-659	-415	-170	75
8.00	-994	-649	-304	41	385	730	1075
9.00	-594	-149	296	741	1185	1630	2075
10.00	-194	351	896	1441	1985	2530	3075
11.00	206	851	1496	2141	2785	3430	4075
12.00	606	1351	2096	2841	3585	4330	5075
13.00	1006	1851	2696	3541	4385	5230	6075

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR TABLE GRAPES

PRICE (DOLLARS/BOX)	YIELD (BOX/ACRE)						
Table Grapes	400	500	600	700	800	900	1000
7.00	-1608	-1364	-1119	-874	-629	-384	-139
8.00	-1208	-864	-519	-174	171	516	861
9.00	-808	-364	81	526	971	1416	1861
10.00	-408	136	681	1226	1771	2316	2861
11.00	-8	636	1281	1926	2571	3216	3861
12.00	392	1136	1881	2626	3371	4116	4861
13.00	792	1636	2481	3326	4171	5016	5861

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR TABLE GRAPES

PRICE (DOLLARS/BOX)	YIELD (BOX/ACRE)						
Table Grapes	400	500	600	700	800	900	1000
7.00	-2676	-2431	-2186	-1941	-1696	-1452	-1207
8.00	-2276	-1931	-1586	-1241	-896	-552	-207
9.00	-1876	-1431	-986	-541	-96	348	793
10.00	-1476	-931	-386	159	704	1248	1793
11.00	-1076	-431	214	859	1504	2148	2793
12.00	-676	69	814	1559	2304	3048	3793
13.00	-276	569	1414	2259	3104	3948	4793

Table 8.

UC COOPERATIVE EXTENSION
COSTS AND RETURNS / BREAKEVEN ANALYSIS
SAN JOAQUIN VALLEY - 1998
THOMPSON SEEDLESS

COSTS AND RETURNS - PER ACRE BASIS

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Table Grapes	7000	5559	1441	5774	1226	6841	159

COSTS AND RETURNS - TOTAL ACREAGE

Crop	1. Gross Returns	2. Operating Costs	3. Net Returns Above Oper. Costs (1-2)	4. Cash Costs	5. Net Returns Above Cash Costs (1-4)	6. Total Costs	7. Net Returns Above Total Costs (1-6)
Table Grapes	525000	416961	108039	433043	91957	513095	11905

BREAKEVEN PRICES PER YIELD UNIT

CROP	Base Yield (Units/Acre)	Yield Units	Breakeven Price To Cover: Operating Costs	Cash Costs	Total Costs
			$ per Yield Unit		
Table Grapes	700.0	Box	7.94	8.25	9.77

BREAKEVEN YIELDS PER ACRE

CROP	Yield Units	Base Price ($/Unit)	Breakeven Yield To Cover: Operating Costs	Cash Costs	Total Costs
			Yield Units / Acre		
Table Grapes	Box	10.00	555.9	577.4	684.1