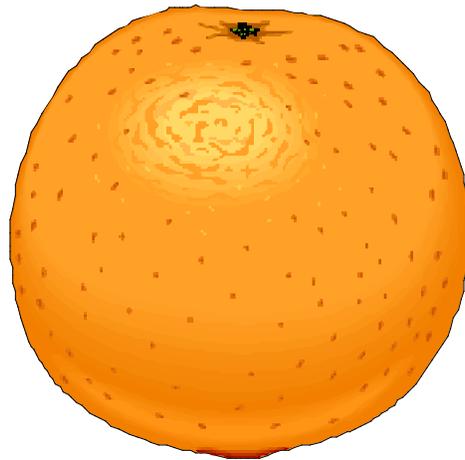


Establishment and Production Costs

Valencia Oranges Ventura County, 1997



By

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INTRODUCTION

Detailed costs for Valencia orange grove establishment and production in Ventura County are presented in this study. The hypothetical grove used in this report consists of a total of 50 acres, 48 of which are being either newly established, or replanted, and the remaining two acres are in buildings and roads.

We base this study on assumptions of production practices and costs that are considered typical for Valencia orange grove establishment and production in Ventura County. These production practices and costs do not reflect the exact values or practices of any grower or shipper, but are rather an amalgamation of costs and practices in the region. Sample costs given for labor, materials, equipment and contract services are based on 1996/97 prices. This study is intended as a guide. It can be used in making production decisions, determining potential returns, preparing budgets and evaluating production loans.

Costs are presented in seven tables.

Table 1.	Costs Per Acre To Establish A Valencia Orange Grove
Table 2.	Costs Per Acre To Produce Valencia Oranges
Table 3.	Costs And Returns
Table 4.	Monthly Cash Costs
Table 5.	Whole Farm Equipment List, Prices, and Annual Investment and Business Overhead Costs
Table 6.	Hourly Equipment Costs
Table 7.	Ranging Analysis Of Costs And Returns

A blank *Your Cost* column is provided to enter your actual costs in **Tables 2** and **3**.

For an explanation of calculations used for the study refer to the attached General Assumptions, call the Area Farm Management Economics Advisor, Etaferahu Takele, University of California Cooperative Extension, Moreno Valley, California, (909) 683-6491 ext. 243 or call the Ventura County Citrus Farm Advisor, Nicholas Sakovich, (805) 645-1469.

ASSUMPTIONS

The following is a description of the assumptions used in the preparation of this cost study.

1. LAND

The grove is comprised of 50 acres of Valencia oranges. Land is valued at \$15,800 per acre. Because only 48 of the 50 acres are planted to oranges, land is valued at \$16,458 per plantable acre.

2. TREES

Orange trees are planted on a 18'x20' spacing with 121 trees per acre. In the second year of establishment, 2% of the original stand, or 3 trees per acre, will be replanted. The orange trees are expected to begin yielding fruit in the third year of establishment and then be productive for up to 40 years.

3. IRRIGATION & FROST PROTECTION

Irrigation: A micro-irrigation system is used. Water to the tree is applied through micro sprinklers that are placed one per tree. The underground portion of the irrigation system is installed prior to planting. The hoses and sprinklers are placed at the time of planting, the cost for the irrigation system includes the cost of a pump, filtration system, hoses, sprinklers and installation. The life of the filtration system, hoses and sprinklers is estimated at 40 years. Tubing and pump changes take place at 20 years.

The cost of water to irrigate crops in Ventura County varies greatly from region to region within the county. In this study, water is calculated to cost \$190.00 per acre-foot. Labor required for irrigation involves turning the system on and monitoring the irrigation lines to make sure that irrigation lines and sprinklers are functioning properly. No assumption is made about effective rainfall. Typically irrigation begins in April and lasts until October, although this varies greatly depending on the amount of rainfall. The amount of irrigation water applied varies by age of trees as shown in **Table A**.

Table A. Applied Irrigation Water

Year	Yearly Water Applications
Year 1	3 Ac In
Year 2	9 Ac In
Year 3	18 Ac In
Year 4	20 Ac In
Year 5	24 Ac In
Year 6 +	30 Ac In

Frost Protection System: In Ventura County, wind machines are used for frost control. Each wind machine serves an area of ten acres. Water is also used as an aid against frost damage. In this study, wind machines are used as a principal instrument for frost protection.

The cost of purchasing and installing the wind machine is shown in **Table 4**. Other costs related to wind machines include \$100 per month stand-by charge by the local power company and \$50 per machine per year for maintenance and upkeep. The most critical time of the year for frost control is December and January, but frost has been known to occur as early as October, and as late as April. In actual practice the cost of frost protection will vary from year to year. For example, there has been no threat of frost since the freeze of the winter of 1990-1991 and the wind machines have remained idle since then. In this study, the costs of frost protection include standby and maintenance charges.

4. ESTABLISHMENT CULTURAL PRACTICES

This grove is established on ground that is currently planted to tree fruit, which are to be removed. The land is assumed to be slightly hilly with sandy loam soils that are adequately drained and moderately fertile. The practices described below represent only the hypothetical grove in this study. These are typical practices for many groves in Ventura County, but may not apply to every situation.

Grove Conversion And Site Preparation: The existing trees are removed in the summer prior to planting. Tree removal is performed by contract or custom operators. The site is then subsoiled to break up underlying soil layers. This process aids root and water penetration, and also pulls up roots from the previous trees which can harbor disease. After subsoiling, the ground is disced twice to break up large clods and smooth the soil. The land is then leveled using a triplane. The grove site is not fumigated. Fumigation with Methyl Bromide will have beneficial effects for controlling diseases, weed seeds, and nematodes, however, it is rarely done because of its high cost. All ground preparations are done in the fall of the year prior to planting, but costs are shown in the first year of establishment.

Planting: Initially, the land is surveyed by a professional survey crew. Then tree sites are marked using lime or gypsum in the early spring just prior to planting. In this study, 121 trees per acre are planted. In March of the first year of establishment, a cover crop of mixed clover is planted between tree rows.

Pruning: Orange trees will normally develop a spherical canopy if left alone during their establishment growth. Therefore light pruning is done during the establishment years to develop the later structure of the tree.

Insect, Disease and Nematode Management: Ranchers in Ventura County typically use a combination of conventional and biological methods to control insect threats to their crops.

During grove establishment, conventional pest control treatments may or not be needed. However, infestations may arise and treatments may include an oil spray or other spray as needed. In this study, it is assumed that no spraying is done during establishment.

Biological control using beneficial insects has become a standard part of Valencia orange pest control programs in Ventura County. These insects include wasps such as *Aphytis* Sp., *Helvolus Metaphycus* and decollate snails, *Rumina*. The cost for beneficial insects

consists of a cooperative insectary membership fee and a charge for services based on the number of trees per acre. In this study with 121 trees, we used \$50 per acre per year for membership and service charges.

Decollate snails are a natural predator of the brown garden snails. Decollate snails eat young to partially grown brown snails along with decaying leaves, fallen fruit and emerging seedlings. Decollate snails are not known to feed on healthy fruit or leaves. Once sufficient colonization levels have been established, the orchards may well remain free of any significant brown snail infestation.

To protect against soil borne fungal diseases, newly planted trees are treated with a fungicide. An application of Ridomil is used at a rate of 0.02 ounces per tree three times in the first two years of establishment via the irrigation system.

There are several pathogens that may attack orange trees. This study included the treatment of Brown Rot only. To protect the fruit from Brown Rot, a fixed copper spray using 3 lbs. of Copper Sulfate and 4.5 lbs. Lime is applied as a skirt spray in year's four and five. Brown Rot control is done to protect the fruit from fungal spores that are splashed onto fruit during the rainy season.

Nematodes also cause significant problem in orange groves. These microscopic invertebrate pests feed on the root system of the tree. Chronic infection leads to decreased fruit size and retarded growth. Treatment involves using a nematicide such as Nematicur, which can be applied through the irrigation system. In this study, Nematicur is used at 2 gallons per acre in year's one, two, four and five of establishment.

Grove Floor Management: The cover crop between tree rows is mowed two times per year, once just before the start of frost season and once in the spring. Discing is avoided to reduce potential erosion and provide habitat for beneficial insects. Weed control begins in the first year of establishment with spraying between trees in each row with Roundup applied at 1 quart per acre per year. Beginning in the second year of establishment, a spot spray of Roundup, at approximately 13 ounces per acre per year, follows later in the year to control sporadic weed growth.

Fertilization: Nitrogen (N) fertilizer is applied in all years of grove establishment through the irrigation system. The amount of fertilizer application during the establishment years is shown in **Table B**. Each year the fertilizer is applied four times in equal proportions, starting in February and ending in May.

Table B. Pounds Of Nitrogen Fertilizer Applied During Valencia Orange Grove Establishment

Establishment Year	Pounds of N Per Tree	Pounds of N Per Acre
Year 1	0.10	12.10
Year 2	0.20	24.20
Year 3	0.30	36.30
Year 4	0.40	48.40
Year 5	0.55	66.55

Citrus trees grown in the south coast region of California can often be deficient in micro-nutrients. In this study, we included a foliar spray of Zinc Sulfate and Manganese Sulfate.

Vertebrate Pest Management: Vertebrate pests require constant control in orange groves. The principal pest is gophers. Gophers can cause severe damage to a tree by feeding on the root system and the bark of tree below the soil line. Trapping and baiting are effective strategies to controlling gopher populations.

Squirrels can also cause erosion problems by their extensive tunneling, especially on hill sides. They may also occasionally gnaw on fruit and irrigation tubing. Squirrel populations can be controlled by trapping, fumigants and / or baiting.

Establishment Cost: The establishment period included five years in our study. This is because trees are assumed not to reach mature production until year six. This is different from the establishment years in the United States Tax Code which includes only through year four of establishment. For tax purposes growers should consult the Farmer's Tax Guide or a Tax Accountant. For this study the total Accumulated Net Cash Cost on **Table 1** in the fifth year, represents the establishment cost. The cost is **\$7,134** per acre or **\$342,432** for the 48 acre grove. The establishment cost is spread over 35 productive years.

5. PRODUCTION CULTURAL PRACTICES

Pruning: During the production period, the pruning of Valencia orange trees consists of hedging and topping by machine beginning sometime between the tenth and fifteenth year. Topping of the trees provides for a convenient picking height and allows for greater sunlight to reach into the canopy of the tree. The cost of the machine pruning is \$90 per acre. The cost of this activity is spread over ten years.

Fertilization: Nitrogen is applied at a rate of 0.805 pound per tree per year through the irrigation system. Also, as in the establishment period, the grove in this study is sprayed with a foliar spray of Zinc Sulfate and Manganese Sulfate.

Grove Floor Management: Cover crops in the row middles are no longer needed in the production years. Early summer weeds in the tree rows are treated with a herbicide spray of 1 quart of Roundup per acre per year. Occasional weed growth is treated with a spot spray of Roundup using approximately 25 ounces per acre per year.

Insect Management: Insect control techniques used in the production years include the custom insecticide application of NR 415 Oil and Lorsban. However, many growers in the Ventura County area do not use insecticide treatments as part of their production cultural practices, believing that there is little or no benefit from an economic standpoint to justify the costs involved. Biological control methods are also continued throughout the production years as well.

Disease and Nematode Management: Copper Sulfate and Lime, at an annual rate of 3 lbs. and 4.5 lbs. respectively, are used for Brown Rot control in the production years.

Many growers will apply a second treatment if the rainy season is particularly heavy or long.

Nematodes may be a problem in mature groves. In this study no treatment for nematodes is included in the production years because many growers choose not to treat.

Pesticides, rates, and cultural practices mentioned in this cost study are a few of those listed in the *UC IPM Pest Management Guideline for Citrus*. Written recommendations are required for all pesticides and are made by licensed pest control advisors (PCA). For pesticide regulatory information and pesticide use permits, contact the county Agricultural Commissioner's office in Ventura. For additional production information contact the Ventura County citrus farm advisor.

6. HARVEST

Harvesting starts in the third year. In this cost study, harvesting is done by contracted labor crew. Hauling to a local packing house is also contracted by the grower. For growers that use their own crews, the actual costs must be reflected in the harvesting and hauling sections of **Tables 1** and **2**.

Harvesting of Valencia oranges is generally done from the middle of May through the middle of September. Typically growers pick their crop once and occasionally two times. In this study, we considered one harvest in July.

Orange growers are assessed fees to pay for industry programs and for participating in marketing cooperatives. These fees are collected at the packing house from the growers' pack-out.

In this study, growers are charged \$1.50 per box for picking and hauling. No packing and assessment fees are included since we used packing house door prices instead of Freight On Board (F.O.B.) prices to calculate returns.

7. YIELDS & RETURNS

Orange trees begin bearing fruit in the third year after planting. Full production is reached in the sixth year. Yield is measured in boxes as shown in **Table C**. A box weighs approximately 50 pounds.

Table C. Typical Yield of Valencia Oranges Per Acre in Ventura County.

Age of Tree	Boxes ¹ Per Acre
Year 1	0
Year 2	0
Year 3	80
Year 4	180
Year 5	400
Production Starting Year 6	700 (average)

1) A box weighs 50 pounds

Returns: The Ventura County Agricultural Commissioner’s Office uses F.O.B. prices in its yearly Annual Crop Report. These prices ranged from \$3.34 per box to \$18.41 per box from 1990 to 1995. **Table D** shows the average annual yields and F.O.B. prices for oranges grown in Ventura County from 1990 to 1995. In this study, returns are calculated using packing house door prices, i.e. the six year average F.O.B. price (\$9.50) minus packing, handling and marketing costs. Currently, charges for packing, handling and marketing in Ventura County approximated \$3.50 per 50 pound box. Therefore we used an average packing house door price of \$6.00 (\$9.50 - \$3.50) per box as the basis for our analysis. However, to cover a broader scenario of productivity and prices, we provided a range of analysis in **Table 7**.

Table D. Average Yield Per Acre and Prices Per Field Box for Valencia Oranges Ventura County, 1990-1995¹

Year	Field Box / Acre	Price Per 50 Pound Field Box (F.O.B.)
1990	527.60	14.64
1991	378.00	18.41
1992	885.60	3.34
1993	406.40	8.99
1994	745.20	4.32
1995	506.00	7.19
Average	574.80	9.50

1) Ventura County Annual Crop Report, 1990-1995

8. RISK

The risks associated with orange grove establishment and production should be noted. 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 the profitability and economic viability of orange production. Risk is caused by various sources of uncertainty which include production, price, and financing. Examples of these risks are insect damage, severe frost, disease, a decrease in price, and increase in interest rates. Because of the risk involved, access to information on production practices, prices, and markets is crucial.

9. LABOR

Hourly wage for workers is \$8.65 per hour for both machine and non-machine workers. This is based on wages paid by the growers in this study. Growers also pay for benefits including, Workers Compensation, Social Security, Medicare, insurance, and other possible benefits. In this study, growers surveyed showed that benefits increased labor wages by 34%. This brings the labor rate to \$11.70 per hour for both machine and non-machine workers. The labor for operations involving machinery are 20% higher than the operation time to account for the extra labor involved in equipment set up, moving, maintenance and repair.

10. CASH OVERHEAD

Cash overhead consists of various cash expenses paid out during the year that are assigned to the whole farm. These costs include property taxes, interest on operating capital, office expense, liability and property insurance, sanitation services, and equipment repairs. Cash overhead costs are found in **Tables 1, 2, 3, 4, and 5**.

Property Taxes: Counties charge a base property tax 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 at 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 11.61% per year. A nominal interest rate is the going market cost of borrowed funds.

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 \$650 for the entire farm.

Office Expense: Office and business expenses are estimated at \$100 per acre. These expenses include office supplies, telephone, computer, fax, copier, bookkeeping, accounting, legal fees, etc.

11. NON-CASH OVERHEAD

Non-cash overhead is comprised of depreciation and interest charged on equipment and other investments. Typically, farm equipment in Ventura County is mostly old. In this study, the current purchase price for new equipment is reduced by 40% to indicate a mix of new and used equipment. Annual equipment and investment costs are shown in Tables 1, 2, 3, and 5. They represent the per acre depreciation and interest costs for each investment on an annual basis.

Depreciation: Depreciation is a reduction in market value of investments due to wear, obsolescence, and age, and is on a straight line basis. Annual depreciation is calculated as purchase price minus salvage value divided by years of ownership of the investment. The purchase price and years of life are shown in Table 5.

Interest On Investment: The interest cost is a charge for the use of capital in Valencia orange production. It is calculated by multiplying the value of land and the average investment in equipment, buildings, trees, etc. (described in **Table 5**) by the real cost of capital in current dollars. The real cost of capital used in this study is the long run average of 4%. Average investment equals the new cost plus salvage value divided by 2.

12. EQUIPMENT CASH COSTS

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.

In allocating the equipment costs on a per acre basis, the hourly charges are calculated first and shown in **Table 6**. Repair costs are based on purchase price, annual hours of use, total hours of life, and repair coefficients formulated by the American Society of Agricultural Engineers (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 \$1.15 and \$1.20 per gallon, respectively.

13. ADDENDUM

1. Due to rounding, totals may be slightly different from the sum of components.
2. The per acre equipment costs in **Table 1** reflect both the value and the level of use (hours and years of use) of the machinery complement. Therefore this cost could be different from the per acre value of the machinery complement in **Table 4**.

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TABLE 1. COSTS PER ACRE TO ESTABLISH A VALENCIA ORANGE GROVE
VENTURA COUNTY - 1997

Year	Cost Per Acre				
	1st	2nd	3rd	4th	5th
Yield: 50 Pound Field Boxes Per Acre			80	180	400
OPERATING COSTS:					
Pre-Planting Costs:					
Tree Removal	150				
Land Preparation: Subsoil & D	11				
Land Preparation: Level	5				
Plant Trees	242				
Orange Trees	1,119				
Total Pre-Planting Costs	1,527	0	0		
Replanting Costs:					
Replant Trees (@ 2%): Labor		6			
Trees - 3		28			
Total Replanting Costs:	0	34	0		
Cultural Costs:					
Irrigate	71	166	308	340	403
Fungicide - Ridomil	39	39			
Fertilizer - Nitrogen	2	4	6	8	11
Cover Crop Planting	41	0	0	0	0
Prune & Sucker Trees	48	97	0	0	0
Chop Brush	44	44	0	0	0
Weed Control - Row Spray	33	33	33	33	33
Weed Control - Spot Spray		9	9	9	9
Weed Control - Mow Middles		21	21	21	21
Leaf Analysis	5	5	5	5	5
Biological Control	50	50	50	50	50
Nematicide	166	166	0	166	166
Vertebrate Control	10	10	10	10	10
Frost Control	126	126	126	126	126
Brown Rot Control				24	24
Foliar Spray - ZnMn	26	26	26	26	26
Pickup Truck Use	113	113	113	113	113
ATV Use	89	89	89	89	89
Total Cultural Costs:	863	998	796	1,020	1,086
Harvest Costs:					
Pick & Haul - \$1.50 per 50 Pound Field Box			120	270	600
Total Harvest Costs:			120	270	600
Interest on Operating Capital	226	57	41	54	61
TOTAL OPERATING COST	2,616	1,089	957	1,344	1,747

Table 1. COSTS PER ACRE TO ESTABLISH A VALENCIA ORANGE GROVE, (cont.)
VENTURA COUNTY, 1997

Year	Cost Per Acre				
	1st	2nd	3rd	4th	5th
Yield: 50 Pound Field Boxes Per Acre			80	180	400
Cash Overhead Costs:					
Office Expense	100	100	100	100	100
Liability Insurance	14	14	14	14	14
Property Taxes	204	232	249	260	270
Property Insurance	146	165	177	186	192
Investment Repairs	138	138	138	138	138
TOTAL CASH OVERHEAD COSTS	602	649	678	698	714
TOTAL CASH COSTS	3,218	1,738	1,635	2,042	2,461
INCOME FROM PRODUCTION	0	0	480	1,080	2,400
NET CASH COSTS FOR THE YEAR	3,218	1,738	1,155	962	61
PROFIT ABOVE CASH COSTS					
ACCUMULATED NET CASH COSTS	3,218	4,956	6,111	7,073	7,134
Depreciation:					
Buildings	48	48	48	48	48
Fuel Tanks & Pumps	16	16	16	16	16
Shop Tools	16	16	16	16	16
Irrigation System	57	57	57	57	57
Wind Machines	60	60	60	60	60
Equipment	163	163	163	163	163
TOTAL DEPRECIATION	360	360	360	360	360
Interest on Investment:					
Buildings	17	17	17	17	17
Fuel Tanks & Pumps	6	6	6	6	6
Shop Tools	6	6	6	6	6
Irrigation System	34	34	34	34	34
Land - Ventura County	658	658	658	658	658
Yearly Establishment		129	198	244	283
Wind Machines	37	37	37	37	37
Equipment	59	59	59	59	59
TOTAL INTEREST ON INVESTMENT	817	946	1,015	1,061	1,100
TOTAL COST FOR THE YEAR	4,395	3,044	3,010	3,463	3,921
INCOME FROM PRODUCTION	0	0	480	1,080	2,400
TOTAL NET COST FOR THE YEAR	4,395	3,044	2,530	2,383	1,521
TOTAL ACCUMULATED NET COST	4,395	7,439	9,969	12,352	13,873

Table 2. COSTS PER ACRE TO PRODUCE VALENCIA ORANGES
VENTURA COUNTY, 1997

Labor Rate: \$11.70/hr. machine labor
\$11.70/hr. non-machine labor

Interest Rate: 0
Yield per Acre: 700.00 Boxes

Operation	Operation Time (Hrs/A)	Cash and Labor Costs per Acre				Total Cost	Your Cost
		Labor Cost	Fuel, Lube & Repairs	Material Cost	Custom/ Rent		
Cultural:							
Irrigation	2.00	23	0	475	0	498	
Prune & Sucker	0.00	0	0	0	9	9	
Chop Brush	0.20	3	2	0	0	4	
Herbicide	0.50	7	13	13	0	33	
Foliar Spray	0.50	7	13	6	0	26	
Fertilizer	0.00	0	0	17	0	17	
Brown Rot Spray	0.50	7	13	4	0	24	
Spot Spray Herbicide	0.44	6	1	10	0	18	
Vertebrate Pest Management	0.00	0	0	10	0	10	
Insecticide Treatment	0.00	0	0	0	200	200	
Leaf Analysis	0.00	0	0	0	5	5	
Biological Control	0.00	0	0	0	50	50	
Frost Protection	0.10	1	0	0	125	126	
Pick-Up Truck	5.70	80	37	0	0	117	
ATV	5.70	80	9	0	0	89	
TOTAL CULTURAL COSTS	15.64	215	88	536	389	1,227	
Harvest:							
Harvest (Pick & Haul)	0.00	0	0	1,050	0	1,050	
TOTAL HARVEST COSTS	0.00	0	0	1,050	0	1,050	
Interest on operating capital @11.61%						33.00	
TOTAL OPERATING COSTS/ACRE		215	88	1,586	389	2,310	
TOTAL OPERATING COSTS/BOX						3.30	
CASH OVERHEAD:							
Office Expense						100	
Liability Insurance						14	
Property Taxes						239	
Property Insurance						170	
Investment Repairs						138	
TOTAL CASH OVERHEAD COSTS						660	
TOTAL CASH COSTS/ACRE						2,970	
TOTAL CASH COSTS/BOX						4	
NON-CASH OVERHEAD:							
	<u>Per</u>	<u>Annual Cost</u>					
	<u>Producing</u>	<u>Acres</u>	<u>Depreciation</u>	<u>Interest @ 4%</u>			
Investment:							
Shop Building	794		48	17		65	
Shop Tools	260		16	6		21	
Fuel Tanks & Pumps	260		16	6		21	
Irrigation	1,563		56	34		91	
Wind Machines	1,667		60	37		97	
Land	16,458			658		658	
Grove Establishment	7,134		183	157		340	
Equipment	1,766		121	39		160	
TOTAL NON-CASH OVERHEAD COSTS						1,454	
TOTAL COSTS/ACRE						4,423	
TOTAL COSTS/BOX						6.32	

Table 3. COSTS AND RETURNS TO PRODUCE VALENCIA ORANGES
VENTURA COUNTY, 1997

Labor Rate: \$ 11.70/hr.machine labor
\$ 11.70/hr.non-machine labor

Interest Rate: 11.61%

	Quantity/Acre	Unit	Price or Cost/Unit	Value or Cost/Acre	Your Cost
GROSS RETURNS:	700	Box	6.00	4,200	
OPERATING COSTS:					
Water:					
Water	30.00	AcIn	15.83	475	
Custom:					
Mechanical Prune	1.00	Acre	9.00	9	
Insecticide Treat	1.00	Acre	200.00	200	
Biological Control	1.00	Acre	50.00	50	
Frost Protection	1.00	Acre	125.00	125	
Herbicide:					
Roundup - Row Spray	1.00	Qt	13.25	13	
Roundup - Spot Spray	25.60	Oz	0.41	10	
Fertilizer:					
Zinc Sulfate	8.00	Lb	0.35	3	
Manganese Sulfate	8.00	Lb	0.38	3	
Soluble N	100.00	Lb N	0.17	17	
Fungicide:					
Copper Sulfate Foliar Spray	3.00	Lb	1.11	3	
Lime Foliar Spray	4.50	Lb	0.153	1	
Rodenticide:					
Vertebrate Pest	1.00	Acre	10.00	10	
Contract:					
Leaf Analysis	1.00	Acre	5.00	5	
Harvest:					
Pick & Haul	700.00	Box	1.50	1,050	
Labor (machine)	16.25	hrs	11.70	190	
Labor (non-machine)	2.10	hrs	11.70	25	
Fuel - Gas	18.53	gal	1.20	22	
Fuel - Diesel	7.19	gal	1.15	8	
Lube				5	
Machinery repair				53	
Interest on operating capital @11.61%				33	
TOTAL OPERATING COSTS/ACRE				2,310	
TOTAL OPERATING COSTS/BOX				3.30	
NET RETURNS ABOVE OPERATING COSTS				1,890	
CASH OVERHEAD COSTS:					
Office Expense				100	
Liability Insurance				14	
Property Taxes				239	
Property Insurance				170	
Investment Repairs				138	
TOTAL CASH OVERHEAD COSTS/ACRE				660	
TOTAL CASH COSTS/ACRE				2,970	
TOTAL CASH COSTS/BOX				4.24	

Table 4. MONTHLY CASH COSTS PER ACRE TO PRODUCE VALENCIA ORANGES
VENTURA COUNTY, 1997

Beginning : FEB 97	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	TOTAL
Ending : JAN 98	97	97	97	97	97	97	97	97	97	97	97	98	
Cultural:													
Irrigation			71	71	71	71	71	71	71				498
Prune & Sucker		9											9
Chop Brush			4										4
Herbicide					33								33
Foliar Spray				26									26
Fertilizer	4	4	4	4									17
Brown Rot Spray										24			24
Spot Spray Herbicide				9			9						18
Vertebrate Pest Management					10								10
Insecticide Treatment			200										200
Leaf Analysis								5					5
Biological Control					50								50
Frost Protection											126		126
Pick-Up Truck	11	11	11	11	11	11	11	11	11	11	11	11	117
ATV	8	8	8	8	8	8	8	8	8	8	8	8	89
TOTAL CULTURAL COSTS	23	32	298	129	183	90	99	95	90	43	145		1,227
Harvest:													
Harvest						1050							1,050
TOTAL HARVEST COSTS						1050							1,050
Interest on oper. capital	0	1	3	5	6	17							33
TOTAL OPERATING COSTS/ACRE	23	33	302	134	190	1157	99	95	90	43	145		2,310
TOTAL OPERATING COSTS/BOX	0.03	0.05	0.43	0.19	0.27	1.65	0.14	0.14	0.13	0.06	0.21		3.30
Overhead:													
Office Expense											100		100
Liability Insurance			14										14
Property Taxes	119					119							239
Property Insurance	85					85							170
Investment Repairs	12	12	12	12	12	12	12	12	12	12	12	12	138
TOTAL CASH OVERHEAD COSTS	216	12	25	12	12	216	12	12	12	12	112	12	660
TOTAL CASH COSTS/ACRE	239	44	327	145	201	1373	110	107	101	54	256	12	2,970
TOTAL CASH COSTS/BOX	0.34	0.06	0.47	0.21	0.29	1.96	0.16	0.15	0.14	0.08	0.37	0.02	4.24

Table 5. WHOLE FARM EQUIPMENT LIST, PRICES, ANNUAL INVESTMENT, AND BUSINESS OVERHEAD COSTS
VENTURA COUNTY, 1997

ANNUAL EQUIPMENT COSTS							
Description	Price	Non-Cash Overhead			Cash Overhead		Total
		Yrs Life	Depreciation	Interest	Insurance	Taxes	
97 55 HP 4WD Tractor	31,102	12	2,333	684	122	171	3,310
97 ATV 4WD	3,861	7	496	85	15	21	618
97 ATV 4WD & sprayer	7,430	10	669	163	29	41	902
97 Mower/Chopper - 8'	6,713	10	604	148	26	37	815
97 Pickup Truck 1/2 T	17,160	7	2,206	378	67	94	2,745
97 Sprayer SP 300G	75,000	20	3,375	1,650	294	413	5,732
TOTAL	141,266		9,683	3,108	554	777	14,122
60% of New Cost *	84,760		5,810	1,865	332	466	8,473

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

ANNUAL INVESTMENT COSTS								
Description	Price	Non-Cash Overhead			Cash Overhead			Total
		Yrs Life	Depreciation	Interest	Insurance	Taxes	Repairs	
INVESTMENT								
Fuel Tanks & Pumps	12,500	15	750	275	49	69	250	1,393
Irrigation	75,000	25	2,700	1,650	294	413	3,750	8,807
Land	789,984			31,599	5,633	7,900	0	45,132
Shop Building	38,100	15	2,286	838	149	210	762	4,245
Shop Tools	12,500	15	750	275	49	69	250	1,393
Grove Establishment	342,432	35	8,805	7,533	1,343	1,883	0	19,565
Wind Machines	80,000	25	2,880	1,760	314	440	1,600	6,994
TOTAL INVESTMENT	1,350,516		18,171	43,931	7,831	10,983	6,612	87,528

ANNUAL BUSINESS OVERHEAD COSTS				
Description	Units/ Farm	Unit	Price/ Unit	Total Cost
Liability Insurance	1.00	Each	650.00	650
Office Expense	48.00	Acre	100.00	4,800

Table 6. HOURLY EQUIPMENT COSTS
VENTURA COUNTY, 1997

Yr Description	Actual Hours Used	Non-Cash Overhead		COSTS PER HOUR Cash Overhead			Operating		Total Costs/Hr.
		Depreciation	Interest	Insurance	Taxes	Repairs	Fuel & Lube	Total Oper.	
97 55 HP 4WD Tractor	10.6	132.54	38.88	6.93	9.72	1.55	3.57	5.12	193.19
97 ATV 4WD	273.6	1.09	0.19	0.03	0.05	0.7	0.92	1.62	2.98
97 ATV 4WD & sprayer	23.2	17.27	4.22	0.75	1.06	0.89	1.38	2.27	25.57
97 Mower/Chopper - 8'	9.6	37.76	9.23	1.65	2.31	2.41	0	2.41	53.36
97 Pickup Truck 1/2 T	273.6	4.84	0.83	0.15	0.21	3.11	3.45	6.56	12.58
97 Sprayer SP 300G	79.2	25.57	12.5	2.23	3.12	18.03	5.29	23.32	66.74

Table 7. RANGING ANALYSIS AND RETURNS TO PRODUCE VALENCIA ORANGES
VENTURA COUNTY, 1997

COSTS PER ACRE AT VARYING YIELDS TO PRODUCE VALENCIA ORANGES							
	YIELD (BOXES/ACRE)						
	550	600	650	700	750	800	850
OPERATING COSTS/ACRE:							
Cultural Cost	1,227	1,227	1,227	1,227	1,227	1,227	1,227
Harvest Cost	825	900	975	1,050	1,125	1,200	1,275
Interest on operating capital	31	31	32	33	33	34	35
TOTAL OPERATING COSTS/ACRE	2,083	2,158	2,234	2,310	2,386	2,461	2,537
TOTAL OPERATING COSTS/BOX	3.79	3.60	3.44	3.30	3.18	3.08	2.98
CASH OVERHEAD COSTS/ACRE	660	660	660	660	660	660	660
TOTAL CASH COSTS/ACRE	2,742	2,818	2,894	2,970	3,045	3,121	3,197
TOTAL CASH COSTS/BOX	4.99	4.70	4.45	4.24	4.06	3.90	3.76
NON-CASH OVERHEAD COSTS/ACRE	1,454	1,454	1,454	1,454	1,454	1,454	1,454
TOTAL COSTS/ACRE	4,196	4,272	4,348	4,423	4,499	4,575	4,651
TOTAL COSTS/BOX	7.63	7.12	6.69	6.32	6.00	5.72	5.47

NET RETURNS PER ACRE ABOVE OPERATING COSTS FOR VALENCIA ORANGES							
PRICE (\$ PER BOX)	YIELD (BOXES/ACRE)						
	550	600	650	700	750	800	850
4.50	392	542	691	840	989	1,139	1,288
5.00	667	842	1,016	1,190	1,364	1,539	1,713
5.50	942	1,142	1,341	1,540	1,739	1,939	2,138
6.00	1,217	1,442	1,666	1,890	2,114	2,339	2,563
6.50	1,492	1,742	1,991	2,240	2,489	2,739	2,988
7.00	1,767	2,042	2,316	2,590	2,864	3,139	3,413
7.50	2,042	2,342	2,641	2,940	3,239	3,539	3,838

NET RETURNS PER ACRE ABOVE CASH COSTS FOR VALENCIA ORANGES							
PRICE (\$ PER BOX)	YIELD (BOXES/ACRE)						
	550	600	650	700	750	800	850
4.50	-267	-118	31	180	330	479	628
5.00	8	182	356	530	705	879	1,053
5.50	283	482	681	880	1,080	1,279	1,478
6.00	558	782	1,006	1,230	1,455	1,679	1,903
6.50	833	1,082	1,331	1,580	1,830	2,079	2,328
7.00	1,108	1,382	1,656	1,930	2,205	2,479	2,753
7.50	1,383	1,682	1,981	2,280	2,580	2,879	3,178

NET RETURNS PER ACRE ABOVE TOTAL COSTS FOR VALENCIA ORANGES							
PRICE (\$ PER BOX)	YIELD (BOXES/ACRE)						
	550	600	650	700	750	800	850
4.50	-1,721	-1,572	-1,423	-1,273	-1,124	-975	-826
5.00	-1,446	-1,272	-1,098	-923	-749	-575	-401
5.50	-1,171	-972	-773	-573	-374	-175	24
6.00	-896	-672	-448	-223	1	225	449
6.50	-621	-372	-123	127	376	625	874
7.00	-346	-72	202	477	751	1,025	1,299
7.50	-71	228	527	827	1,123	1,425	1,723

To simplify our information, trade name and products have been used. No endorsement of named products is intended nor is criticism implied of similar products which are not mentioned.

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