

# LEMONS

SAMPLE COST OF PRODUCTION

VENTURA COUNTY

[Ventura Co.]  
Agricultural Extension Service  
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## LEMONS--VENTURA COUNTY

The purpose of this study is to provide growers with a guide to costs of production, prices, and yield per acre so they may better analyze the profitability of their orchard operation.

The figures developed in this report are sample cost estimates, based on a typical lemon orchard in Ventura County. Characteristics of this typical orchard are as follows:

A forty-acre planting with tree spacing 22 x 22 or 90 trees per acre.

Owner-operated with additional labor hired at \$1.60 per hour.

Pruning, brush cutting, and insect and disease control are done by commercial companies on contract.

Irrigation is by furrows and the soil is nontilled.

Frost protection is provided with two 100 h.p. electric windmachines (5 h.p. acre) and 15 return stack orchard heaters per acre.

Equipment and building includes a D-2 tractor, pickup truck, fertilizer spreader, self-propelled weed sprayer, and shed.



## CULTURAL OPERATIONS

### FERTILIZATION

Lemons require adequate fertilization to maintain maximum yields of quality fruit. Nitrogen is usually applied at the rate of one pound of actual N per tree per application. Three applications (February, June, and September) per year are typical.

#### Costs

Anhydrous ammonia- - - - -	10.0	¢ per lb. N
Urea- - - - -	10.3	¢ per lb. N
Ammonium nitrate - - - - -	12.5	¢ per lb. N
Calcium nitrate- - - - -	17.7	¢ per lb. N
Equipment per application- - -	.96	¢ per acre

### IRRIGATION

Adequate but not excessive moisture should be available to trees at all times. Orchards in coastal zones require less water than interior. Peak water use is during hot weather--June through September. Number of irrigations and amount of water varies with season and soil. Water requirement is about 2 acre-feet per year applied in 6 irrigations of 4 acre-inches each.

#### Costs

Water - \$15.00 per acre-foot, or	
1.25 per acre-inch	
Labor - 1.60 per acre per irrigation	

### INSECT CONTROL

Orchards should be kept clean of serious insect pests at all times. Two treatments are generally necessary--spring, a non-oil spray for mites; fall, an oil spray for scale and mites. Micronutrients (zinc and manganese) are usually added to one or both sprays. Urea, for nitrogen, may also be added. Pest control operations are usually done on contract.

## PRUNING

Lemons require moderate pruning each year to maintain good vegetative growth, capable of setting and producing quality fruit. Trees may be pruned by hand or mechanically topped and hedged. Pruning is largely done on contract. Sample cost is an average based on an annual program of alternating between hand and mechanical pruning. The following costs are based on labor at \$1.60 per hour, one tree pruned per hour and 90 trees to the acre.

	<u>Hand</u>	<u>Mechanical</u>
Prune	\$144.00	15.00
Pile brush	1.60	1.60
Cut brush	13.00	13.00
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Total	\$158.60	\$29.60
Total 2 yrs.		\$188.20
Average per yr.		94.10

## FROST PROTECTION

Frost protection equipment consists of electric windmachines of a size to provide 5 h.p. per acre and 15 return stack orchard heaters per acre. Standby charge for windmachine is \$7.50 per h.p. per year.

1964 was a mild winter. For this study, it is assumed that no orchard heaters were operated. The windmachines ran a total of 10 hours.

### Costs

Standby- - - - -	\$7.50 x 5 =	\$37.50
Move heaters - - - - -	.06 x 15 =	.90
Power - - - - -	1.46 x 10 =	14.60
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	Total =	\$53.00

## DISEASE CONTROL

Two important diseases of lemons which should be prevented or controlled are:

Brown Rot - A skirt spray of Bordeaux prior to the rainy season prevents serious loss of the fruit from brown rot, a fungus disease. The skirt spray is applied by commercial sprayers. Foliage to three feet high, litter under trees, and soil between trees should be sprayed.

Gummosis - A soil-borne fungus disease, gummosis, affects the bark at the ground level. Painting tree trunks with Bordeaux paint helps prevent its occurrence.

## RODENT CONTROL

Gophers may severely damage trees by girdling bark around the trunk and primary roots. Constant vigilance is required. Control with traps or poison bait.

## WEED CONTROL

Two types of soil management may be used--tillage and non-tillage. Under non-tillage weed control is obtained through the application of herbicides to the soil in the spring and fall. Application is at the rate of two pounds of material per acre actually sprayed. For example, an acre of orchard with trees covering 50% of the acre would use one pound of material. In addition, spot spraying perennial weeds with oil during summer is required.

## TREE REPLACEMENT

A charge for tree replacement is based on an average replacement of one tree per acre per year.

New tree- - - - -	\$2.75
Pull old tree (labor and tractor) - - - - -	.91
Fumigate soil (labor and material)- - - - -	1.15
Special care - - - - -	.80
6. Total	<u>\$5.61</u>

## CASH OVERHEAD

### TAXES

Taxes on lemon orchards are based on the assessed value of the land and the productivity of the trees. Great variations exist in taxes paid on lemon acreage due mainly to different assessed value for land. The tax used in the data sheet is \$81.00 per acre.

### MAINTENANCE & REPAIR

Maintenance and repair charges are for incidental repair and maintenance to equipment, sheds, roads, irrigation system, etc.

### MANAGEMENT CHARGE

A charge for management of \$1.00 per acre per month is made.

### GENERAL EXPENSE

General expense is the charge for laboratory service, protective league assessments, truck, telephone, office, farm and professional organizations and societies, etc.

**INVESTMENT OVERHEAD**

INVESTMENT

ITEM	PER ACRE	ANNUAL DEPRECIATION
Trees- - - - -	\$1200	\$ 40.00
Irrigation System- - - - -	196	6.53
Frost Protection - - - - -	364	36.40
Tractor D-2- - - - -	175	11.66
Pickup - - - - -	57	11.50
Fertilizer Spreader- - - - -	9	.90
Weed Sprayer - - - - -	40	4.00
Shed	20	.66
<b>TOTAL</b>	<b>\$ 2061</b>	<b>\$ 111.65</b>

DEPRECIATION

Depreciation represents a reasonable cost for wear and tear or obsolescence of depreciable property (having a life of more than one year) used on the orchard. To determine yearly rate, divide the cost less salvage value by its useful life.

INTEREST

Interest on investment is a charge for monies invested for land, trees, buildings, and equipment.

**HARVEST**

Prices paid for picking fruit vary widely. They depend upon tree size, fruit size, and yield per tree. Prices to be paid are determined for each orchard when picking starts. An average price per field box for 1964 was approximately 50 cents.

Hauling charges range from 4 to 6 cents per field box.



**YIELD**

Lemon yields per acre vary widely in the county, ranging from 400 to 1200 field boxes per acre. A field box is approximately 50 pounds.

Average production for the last three years, according to the Agricultural Commissioner's reports, is given below. The figures were derived by taking total production reported and dividing by total bearing acreage.

	1962	1963	1964
Bearing acres	20,887	22,895	21,876
Average field boxes/ac.	588	504	735

The lower yield for 1963 is due to a severe freeze which damaged the fruit.

The high yield for 1964 represents one of the largest crops in history.

**PRICE**

Prices received by growers for lemons vary greatly, depending on the supply and demand conditions in the fresh and processed markets. The on-tree (pre-harvest) grower price for California lemons in recent years as reported by the U.S.D.A. is presented below.

	1961	1962	1963
On-tree price per field box	\$1.05	.95	1.80

## RETURNS

Growers may calculate net return on a per-acre basis using their specific costs, yield and prices received.

Grower on-tree return per field box equals return from packinghouse minus cost of the picking and hauling.

On-tree return per acre is obtained by multiplying yield per acre by on-tree return per field box.

Net return per acre is obtained by comparing on-tree return with pre-harvest on-tree costs.

Return on investment--Growers may also express net return per acre as a per cent return on investment. To do this, take the total on-tree returns, subtract the total on-tree cost less interest, and then divide the difference by the investment per acre.

### AN EXAMPLE

Total on-tree cash cost	\$ 474.00
Total on-tree cost	933.00
Total on-tree cost - less interest	586.00
Packinghouse return	1.83
Picking and hauling cost per f.b.	0.56
On-tree grower return per f.b.	1.27
Investment per acre	\$6,811.00
Yield per acre	735

- (1) Grower on-tree return per field box:  
 $\$1.83 - \$0.56 = \$1.27$
- (2) On-tree return per acre:  
 $735 \times \$1.27 = \$933.45$
- (3) Net return per acre  
 $\$933.45 - \$933.00 = \$0.45$
- (4) Net return per acre above cash costs:  
 $\$933.45 - \$474.00 = \$459.45$
- (5) Return on investment:  
 $\$459.45 \div \$6811.00 = 5.10\%$

NET RETURN PER ACRE AT \$1.27 PER FIELD BOX ON-TREE

Field boxes per acre	400	500	600	700	735*	800	900	1000
On-tree return per acre	\$ 508	635	762	889	933	1016	1143	1270
Total on-tree cost per acre	\$ 933	933	933	933	933	933	933	933
Net return per acre	\$ -425	-298	-171	- 44	- 0	- 83	210	337

COSTS PER FIELD BOX AT VARYING YIELDS

Cash on-tree cost (\$474 per acre)	\$1.18	.95	.79	.68	.64	.59	.53	.47
Cash on-tree + depreciation (\$586 per acre)	\$1.46	1.17	.98	.84	.80	.73	.65	.59
Total on-tree costs (\$933 per acre)	\$2.33	1.87	1.55	1.33	1.27	1.17	1.04	.93

\*County average yield

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