

< Orange

# NAVELS

SAMPLE COST OF PRODUCTION

VENTURA COUNTY

Ventura Co  
Agricultural Extension Service  
University of California,  
684 Buena Vista Street  
Ventura, California

## NAVELS--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 profitableness of their orchard operation.

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

A twenty-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 non-tilled.

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

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

SAMPLE COSTS TO PRODUCE NAVELS

(Based on 1964 Costs)

<u>CULTURAL OPERATION</u>	<u>COSTS PER</u> <u>ACRE FIELD BOX*</u>	
FERTILIZATION- - - - -	\$ 22	
IRRIGATION - - LABOR - - - -	14	
- WATER - - - -	45	
INSECT CONTROL-SPRING- - - -	46	
-BIOLOGICAL- - - -	8	
DISEASE CONTROL-BROWN ROT- - - -	14	
-GUMMOSIS - - - -	4	
RODENT CONTROL - - - - -	4	
WEED CONTROL - - - - -	14	
PRUNING- - - - -	24	
FROST PROTECTION - - - - -	68	
TREE REPLACEMENT - - - - -	6	
MISCELANEOUS- - - - -	10	
	SUB-TOTAL \$279	\$.64

CASH OVERHEAD

TAXES- - - - -	\$90	
MAINTENANCE & REPAIR - - - -	12	
MANAGEMENT CHARGE- - - - -	12	
GENERAL EXPENSE- - - - -	25	
	SUB-TOTAL \$139	\$.32

TOTAL ON-TREE CASH COSTS	\$418	\$.96
--------------------------	-------	-------

INVESTMENT OVERHEAD

DEPRECIATION - - - - -	\$128	\$.29
INTEREST ON INVESTMENT- - -	348	.80
	SUB-TOTAL \$476	\$1.09

TOTAL ON-TREE COSTS	\$894	\$2.05
---------------------	-------	--------

TOTAL ON-TREE COSTS-LESS INTEREST 546	\$894	\$1.25
---------------------------------------	-------	--------

\* Based on County Average of 434 field boxes

## CULTURAL OPERATIONS

### FERTILIZATION

Navels require fertilization to maintain maximum yields. Too much nitrogen, however, aggravates poor fruit quality. Nitrogen per tree varies with tree age and soil type. Under most conditions about two pounds of actual nitrogen per tree per year will maintain maximum yields of quality fruit. Nitrogen is usually applied in February. There is no advantage to split applications. However, if split, second application should be applied before June.

#### 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	.76 ¢ per acre

### IRRIGATION

Adequate, but not excessive moisture should be available to the trees at all times. Orchards near the coast require less water than those in the interior area. Peak water use is during hot weather--June through September. Number of irrigations and amount of water varies with season and soil. Water duty about 3 acre-feet per year.

### INSECT CONTROL

Orchards should be kept commercially clean of serious pests at all times. Two treatments are generally required--Spring, a non-oil spray for mites and aphids; Fall, an oil spray for scale and mites.

Red and black scale have been successfully controlled with natural enemies. If biological control is used, the fall spray may not be required. For this study, biological control and one spring spray is used.

Micronutrients (zinc and manganese) and urea are usually added to the spray mix.

Pest control operations are usually done on contract.

## PRUNING

Navel oranges do not require regular pruning. Young trees should be suckered and trained. Mature orchards need to be hedged and/or topped to facilitate movement through the orchard.

Costs are based on hedging every five years and dead brushing every eight years.

Hedging- - - - -	\$15.00	
Pile brush - - - - -	1.60	
Cut brush - - - - -	15.00	
<hr/>		
Total 5 years - - - - -	\$31.60	
Total per year- - - - -	6.32	\$ 6.32
Dead brushing- - - - -	\$ 144.00	
( 1 tree per hour)		
<hr/>		
Total 8 years- - - - -	\$ 144.00	
Total per year- - - - -	18.00	\$18.00
<hr/>		
Total per year - - - - -		\$24.32

## FROST PROTECTION

Frost protection equipment consists of an electric windmachine of a size to provide 5 h.p. per acre and 15 return stack orchard heaters per acre. Standby charge for a 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 windmachine ran a total of 20 hours.

<u>Costs</u>		
Standby- - - - -	\$7.50 x 5 =	\$37.50
Move heaters - - -	.06 x 15 =	.90
Power - - - - -	1.46 x 20 =	29.20
<hr/>		
Total	=	\$67.60
5..		

## DISEASE CONTROL

Diseases should also be prevented or controlled as required.

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 plus litter under trees and soil between trees should be sprayed.

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

## RODENT CONTROL

Gophers may severely damage trees by girdling bark around 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 & tractor)	1.71
Mulch soil (labor & material)	1.15
Special care	.80

6. Total \$ 5.41

CASH OVERHEAD
---------------

### TAXES

Taxes on a navel orchard are based on the assessed value of the land and the productivity of the trees. Great variations exist in taxes paid on navel orange acreage due mainly to different assessed value for land. The tax used in the data sheet is \$90.00 per acre.

### MAINTENANCE AND REPAIRS

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

### MANAGEMENT CHARGE

A charge of \$1.00 per acre per month is made for managing the enterprise.

### GENERAL EXPENSE

Charges for laboratory service, insurance, truck, telephone, office, Farm Bureau, Professional Societies, etc., etc.

## INVESTMENT OVERHEAD

### INVESTMENT

ITEM	PER ACRE	ANNUAL DEPRECIATION
Trees- - - - -	-\$1200	\$ 40.00
Irrigation system- -	196	6.53
Frost protection - -	364	36.40
Tractor (wheel) - -	120	12.00
Pickup - - - - -	115	23.00
Fertilizer spreader-	18	1.80
Weed sprayer - - - -	80	8.00
Shed - - - - -	20	.66
TOTAL	\$ 2,113	\$ 128.39

### 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 28 cents.

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



**YIELD**

Navel orange yields per acre vary widely in the county, ranging from 300 to 700 field boxes per acre. A field box is approximately 50 pounds.

Average production for the last three years according to Agricultural Commissioner's Reports is given below. Figures derived by taking total production reported and dividing by total bearing acreage.

	1962	1963	1964
Bearing Acres	11,944	2,039	1,941
Average f. b. / acre	343	404	498

**PRICE**

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

	1961	1962	1963
On-tree price \$ per field box	\$3.29	3.62	2.70

## 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- - - - -	-\$418.00
Total on-tree cost - - - - -	894.00
Total on-tree cost - less interest - - -	546.00
Packinghouse return- - - - -	3.04
Picking and hauling cost per f.b.- - -	.34
On-tree grower return per f.b. - - - -	2.70
Investment per acre- - - - -	-\$6,863.00
Yield per acre - - - - -	434

(1) Grower on-tree return per field box:

$$\$3.04 - \$0.34 = \$ 2.70$$

(2) On-tree return per acre:

$$434 \times \$ 2.70 = \$1,171.80$$

(3) Net return per acre:

$$\$1,171.80 - \$894.00 = \$277.80$$

(4) Net return per acre above cash costs:

$$\$1,171.80 - \$418.00 = \$753.80$$

(5) Return on investment:

$$\$1,171.80 - \$546.00 = \$625.80$$

$$\$ 625.80 \div \$6,863.00 \times 100 = 9.1\%$$

NET RETURN PER ACRE AT \$2.70 PER FIELD BOX ON TREE

Field boxes per acre	400	434*	500	600	700
On-tree return per acre	\$ 1080	1172	1350	1620	1890
Total on-tree cost per acre	\$ 894	894	894	894	894
Net return per acre	\$ 186	278	456	726	996

COSTS PER FIELD BOX AT VARYING YIELDS

Cash on-tree cost (\$418 per acre)	\$ 1.04	.96	.84	.70	.60
Cash on-tree + depreciation (\$545 per acre)	\$ 1.36	1.26	1.09	.91	.78
Total on-tree costs (\$894 per acre)	\$ 2.23	2.06	1.79	1.49	1.28

\* County average yield

Prepared by:

B. W. Lee, Farm Advisor - Ventura County  
Robert C. Rock, Farm Management Specialist  
Agricultural Extension Service

Acknowledgements:

We wish to acknowledge the kind assistance of growers, pest control operators, custom operators and packinghouse managers for their time and effort which made this study possible.

Co-operative Extension work in Agriculture and Home Economics, College of Agriculture, University of California, and United States Department of Agriculture cooperating. Distributed in furtherance of the Acts of Congress of May 8 and June 30, 1914. George B. Alcorn, Director, California Agricultural Extension Service.

July, 1965  
500 c.