

## CITRUS GROVE PRICES AS DETERMINED BY FRUIT PRODUCTION POTENTIAL<sup>1</sup>

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**Abstract.** Uncertain weather, fluctuating yields and unstable prices lead to fluctuating annual income for citrus growers. Decreasing annual incomes and alternative investment opportunities contribute to producing citrus acreage being placed in the open land market. This paper is presented to help growers evaluate grove market prices when expected income from future yields will be used to pay for the acreage. Expected net return to land and trees is derived by budgeting five-year average cost and return data. Dividing this net return by a desired percentage rate of return gives a per acre value (price). This methodology can assist growers to systematically value market prices for citrus acreage. With various returns on processed and fresh fruit, grove value examples are given for early and midseason oranges, late season ('Valencia') oranges, and white seedless grapefruit on irrigated and non-irrigated acreage.

When growers analyze grove acreage for sale on the open land market, many factors should be considered. Proximity to expanding urban areas for residential or commercial development and land ownership viewed as a hedge against inflation are 2 such factors (1). An additional factor covered herein involves determining a price for the acreage based on its fruit production potential. Fruit sales in the future must cover cash operating expenses, fixed grove costs, management, and a return (income) to capital invested in land and trees.

### Method

The grower can estimate an annual dollar return to land and trees by budgeting his expected costs and returns (2). Total revenue is based upon expected prices and yields. Determining annual return to land and trees requires placing accurate costs (expenses) on all inputs of production. Subtracting total expenses from total revenue gives net return to land and trees. Dividing annual net return to land and trees by his desired rate of return on investment gives the maximum price the grower can pay for the acreage and realize his desired return. A higher price for the acreage will decrease his rate of return, while a lower price will increase his return rate. Reliability of grove price estimates depends upon how accurately future annual returns to land and trees can be projected.

Budgeted costs and returns for processed fruit grown in the central or ridge area of the state are shown in Table 1 (8). Estimated per acre return to land and trees in the 1976-77 growing season was slightly over \$286 (8). Assume the grower desired a 9.5% rate of return for his money and risks. Dividing \$286 by 0.095, gives a per acre value of \$3,011. At any price over \$3,011 for the acreage he would not receive his 9.5% desired return.

The grove purchased will have a productive life of many years. The grower's task is to project yearly returns into the future. Basing expected annual return to land and trees on one year's records is risky business. The market is unstable and the weather uncertain. For example, the 1977 January freeze caused large fluctuations in fruit prices and subsequent returns to land and trees. Grove production records are the best information source for basing future return projections. The County Extension Office, the Florida Crop and Livestock Reporting Service, Florida Citrus Mutual, and other similar organizations can also provide cost and return information on the type acreage being considered. Use of this information should be seasoned with common sense, experience, and judgment of the effects that changes in technology, inflation, and external factors have on production.

The use of cost and return information for several seasons provides more representative return expectations than the previous year's cost and return information. Five-year average price and cost figures for fruit grown on the ridge are given in Tables 2 and 3 (2, 3, 4, 5, 6, 7, 8, 9). For analysis purposes, it is assumed these budgeted returns and costs will continue into perpetuity and that fluctuations in returns and costs in the future will vary proportionately.

### Examples

The example grove offered for sale is 200-irrigated acres of late season ('Valencia') oranges. Average yield of processing fruit for similar groves for the last 5 years has been approximately 333 boxes (8). Multiplying yield per acre by the five-year average price per box, \$1.87 (Table 2), gives an estimated gross return of \$623/acre, or \$124,600 for 200 acres.

Five-year average per acre production costs for irrigated processed fruit were approximately \$327 (Table 3). Gross return (\$623) less estimated costs (\$327) gives a net return of \$296/acre or \$59,200 for 200 acres. If the grower's desired rate of return is 9.5%, dividing net return per acre (\$296) by 0.095, gives a value of \$3,116. At any price over \$3,116/acre, he would not receive his 9.5% desired return.

Suppose the 200-acre block was irrigated, white seedless grapefruit sold by all methods (packinghouse eliminations are shipped to the processor). By following the above procedure, with a \$1.49/box price, a yield of 433 boxes/acre, a \$366/acre production cost, and a 9.5% desired return on investment gives a per acre value of \$2,939.

### Discussion

Table 4 provides some selected maximum prices to pay for grove acreage with varying net return per acre and percentage return on investment. For example, dividing \$100 net return per acre by a desired 5% rate of return on investment gives \$2,000. The grower can pay up to \$2,000 per acre for the grove before his return on investment drops below 5%.

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Table 1. Estimated annual per acre costs and returns for a 20-year-old mature, irrigated, round orange grove on rough lemon rootstock producing citrus for processing in central Florida. 1976-77.\*

Item	Description	Amount
I. Revenue	333 boxes @ \$1.90 70 trees/acre	<u>\$632.70</u>
II. Expenses		
Spray program	Three spray applications	\$ 76.73
Fertilizer		
Material	16-0-16, 832 lbs.	\$42.57
Application	2 @ \$3.34	<u>6.68</u>
		49.25
Dolomite		
Material	1/3 ton @ \$11.88	\$ 3.96
Application	1 ton every third year	<u>1.13</u>
		5.09
Weed control		
Material	Krovar II, 2 lbs./grove acre	\$10.56
Application		<u>3.41</u>
		13.97
Discing	Twice/year	8.12
Chopping	Twice/year	9.16
Pruning (maintenance)		
Topping	$(\$125/\text{hr.} \div 8.5 \text{ acre/hr.}) \div 3 \text{ years}$	4.90
Hedging	$(\$45.64/\text{hr.} \div 4 \text{ acre/hr.}) \div 3 \text{ years}$	3.80
Chopping brush	Custom rate	4.58
Irrigation	13.2 inches/year	99.46 <sup>†</sup>
Tree replacement and care		
Pull trees and remove	1.4 trees/acre	\$10.14
Prepare site, plant and ring	(Includes trees)	8.65
Water	(Avg. 14 waterings)	11.90
Fertilizer	(Includes application)	5.00
Bank and unbank		<u>3.80</u>
		\$ 39.49
Management	5% of gross sales*	<u>31.64</u>
III. Total specified costs		\$346.19
IV. Return to land and trees		<u>\$286.51</u>

\*Based on custom rates. Costs should be adjusted to fit the individual grove situation.

<sup>†</sup>Includes \$73.00 per acre of fixed costs; operating costs are \$26.46 per acre.

\*Based upon commonly accepted estimate for efficient management in citrus production. Management charge should be adjusted to fit the individual grove situation.

Table 2. Summary of comparative citrus average on-tree prices per box from 1973 thru 1977.

Fruit type	1973	1974	1975	1976	1977	5-year average
Early and midseason oranges						
Processed	\$1.40	\$1.32	\$1.40	\$1.20	\$1.20	\$1.42
Fresh	1.83	2.28	2.15	2.35	3.93	2.51
All methods	1.43	1.38	1.46	1.84	1.21	1.46
Late (Valencia) oranges						
Processed	1.70	1.57	1.80	2.40	1.90	1.87
Fresh	1.88	1.88	2.05	2.50	3.95	2.45
All methods	1.71	1.59	1.82	2.41	2.11	1.93
White seedless grapefruit						
Processed	1.52	1.14	.82	.57	.65	.94
Fresh	2.85	2.20	2.55	2.08	2.60	2.46
All methods	2.06	1.58	1.55	1.17	1.07	1.49

Table 3. Summary of comparative interior citrus production costs per acre from 1973 thru 1977.\*

Fruit type	1973	1974	1975	1976	1977	5-year average
Non-irrigated						
Processed fruit	\$183.24	\$226.63	\$261.55	\$250.84	\$267.77	\$238.01
Irrigated						
Processed fruit	246.02	311.38	357.60	350.23	368.49	326.74
Non-irrigated						
Fresh fruit	215.98	261.20	302.63	296.33	309.65	277.16
Irrigated						
Fresh fruit	278.76	345.95	398.68	395.72	410.37	365.90

\*Does not include *ad valorem* taxes or interest on investment. Does include a management charge. Based on custom rates. Costs should be adjusted to fit the individual grove situation.

Table 4. The maximum amount to pay for a citrus grove given net return per acre and percentage return on investment.

% Return on Investment	Net return per acre						
	\$100	\$150	\$200	\$250	\$300	\$350	\$400
4%	\$2,500	\$3,750	\$5,000	\$6,250	\$7,500	\$8,750	\$10,000
5%	2,000*	3,000	4,000	5,000	6,000	7,000	8,000
6%	1,667	2,500	3,333	4,167	5,000	5,833	6,667
7%	1,429	2,143	2,857	3,571	4,286	5,000	5,714
8%	1,250	1,875	2,500	3,125	3,750	4,375	5,000
9%	1,111	1,667	2,222	2,778	3,333	3,889	4,444
10%	1,000	1,500	2,000	2,500	3,000	3,500	4,000
11%	909	1,364	1,818	2,273	2,727	3,182	3,636
12%	833	1,250	1,667	2,083	2,500	2,917	3,333
13%	769	1,154	1,538	1,923	2,308	2,692	3,077
14%	714	1,071	1,429	1,786	2,143	2,500	2,857
15%	667	1,000	1,333	1,667	2,000	2,333	2,667
16%	625	938	1,250	1,563	1,875	2,180	2,500
17%	588	882	1,176	1,471	1,765	2,059	2,353

\*Example in text, under "Discussion."

Current Florida land prices may be higher than the grove prices derived above and those in Table 4 due to factors other than income from fruit previously mentioned. These prices do, however, provide guidelines on how much the grower should pay for a producing citrus grove and still maintain his desired rate of return.

### Summary

Grove investments can be valued on costs and returns, and rate of return on investment. However, accuracy in establishing grove value rests upon accurate determination of expected costs and returns to that acreage. The above example analysis was based on average industry prices, costs and return figures. It is suggested that growers insert their individual production figures, experience, and desired rate of return into the analysis to determine what price to pay for grove acreage based on its fruit production potential.

The situation example was based on keeping the grove in production. If grove value is based upon other future uses (for example, development), the value should be based more upon market conditions than net income from citrus production.

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