

## FACTORS AFFECTING ECONOMIC RETURNS FOR FLORIDA ORANGE GROWERS<sup>1</sup>

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**Abstract.** The decade of the 1980's may be one of increased competition and uncertainty for Florida orange growers. By the mid-1980's citrus production in both Florida and Brazil is expected at or near record levels. Increased supplies are expected to result in price reductions without significant growth in demand. Basing investment and management decisions on today's market conditions could result in unsatisfactory rates of return in the years ahead.

Factors influencing grower returns from Florida orange groves are identified and discussed in a citrus management framework.

### Forces of Supply and Demand

Agricultural producers in the United States have generally operated in a competitive environment which has thrust them into the role of pricetakers. The price they are paid for their product is determined by market supply and demand. In the case of perfect competition, the producer does not have any influence over market supply and demand because of the large numbers of buyers and sellers in the market. Prices for Florida oranges and orange products are also determined by the forces of supply and demand. However, unlike most agricultural industries, the Florida orange industry has afforded growers, at least collectively, an opportunity to exert some pressure of influence over the price received for his oranges.

On the supply side, the production of Florida orange growers has accounted for more than three-fourths of all orange production in the U.S. Furthermore, Florida production has represented nearly 90% of the processed orange production during the last five seasons. In addition, Florida's frozen concentrated orange juice (FCOJ) production accounts for an estimated 90-95% of the domestically produced supply in the U.S. market.

With respect to demand, the Florida orange growers have been able to influence the demand for their products through generic advertising and promotion programs. During the decade of the 1970's, movement of FCOJ increased an average annual rate of 7.7%, while chilled orange juice (COJ) movement increased an average of 12.5% per year (3).

### Outlook for the '80's

The general outlook for the 1980's suggests that demand for FCOJ will continue growing at about a 5-6% annual rate (4). The impressive growth in demand for the chilled

orange juice (COJ) is forecast to continue; however, a moderation of the growth rate is expected some time during the next decade. Anticipated growth rates are dependent on continued effective levels of marketing activities in terms of advertising and promotion.

The supply outlook for the 1980's reflects the growing importance of Brazilian production in the U.S. FCOJ market. Both Brazilian production and FCOJ export availabilities are forecast to increase through at least 1985. By 1985, the state of Sao Paulo, Brazil, is expected to process in excess of 170 million boxes of oranges, or about a one-third increase over 1980 levels (6).

Florida round orange and Temple production is expected to recover from the 1981 freeze by the 1983-84 season, with an average crop of 203 million boxes. The long range trend suggests that average production will continue increasing to a level of about 220 million boxes in the 1991-92 season (2). If recently observed average tree planting rates continue, Florida round orange and Temple production is estimated to decrease somewhat during the 1990's to an average production level of about 212 million boxes by the end of the century.

With Brazil becoming a residual supplier of orange juice for the U.S. markets, imports will continue to have an impact on prices in the years ahead. As the components of supply become more complex with the growth of imports and non-Florida reprocessor/distributors, the implication of supply/demand interaction for price become less certain.

As the Florida orange grower enters an era of price and market uncertainty, the impact of managerial input on the grower's financial position becomes even more important. If the grower becomes less able to influence the price or value of his fruit, then increased effort needs to be directed towards controlling the cost of production. The current 1980-81 season should serve as a reminder of the price variability and uncertainty which may confront the grower in the next few years. Although the current FOB card price for FCOJ is \$4.25 per dozen six-ounce cans, the season began with a card price of \$3.00 per dozen. Announced price promotions prior to the January 13 and 14, 1981, freeze had reduced the FOB price to \$2.70 per dozen six-ounce cans. Financial success in the next five years may well depend on successful grove management practices.

### Grove Management & Citrus Budgets

Managing a citrus operation requires making choices among many different production practices. Performing an economic evaluation of these practices requires records of yields, materials and labor used, a consideration of costs and prices, and a schedule of production practices (5). A citrus enterprise budget systematically lists yields, product prices, quantities and costs of materials, allocation of time and labor, and scheduled cultural practice costs for a production period or marketing season (1).

Lenders prefer well documented loan requests and thorough financial statements. Computerized budget printouts can show the basis for the capital being requested, and aid in estimating the borrower's repayment capacity. A citrus budget can be the backbone of a grower's financial package that is desired by most agricultural lenders.

Citrus enterprise budgeting is one management technique which can assist growers in their decision-making, re-

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flecting changes in production methods or tax legislation. The University of Florida and the Cooperative Extension Service have available a computerized budget generator for citrus groves, and other farming enterprises. The budget analysis can be accessed through a batch output from the Gainesville campus or, in the future, through mini- and micro-computers in the citrus grower's local county agricultural extension office.

An enterprise budget portrays a specific scenario representing the costs and returns for one production period and one particular situation. Periodically updating a budget can provide citrus growers with accurate information for production, financial, and tax management decision-making. Although representative grove production practices and yields are identified and portrayed in the computerized budget, the budget can be modified to accurately represent

a specific grove or situation by changing any of the times in the budget. The budget is used as a hands-on mechanism to aid citrus growers effectively analyze their production management practices.

A description of the various agendum and output from the computerized citrus enterprise budget is presented in the following paragraphs, with a few selected budget output examples of a representative 25-year-old interior Valencia grove whose ownership was established prior to 1981.

The budget agendum in Table 1 is a cost and returns budget containing the total production and value for each item produced to generate total receipts, the total quantity and cost of each operating input item required, and the net returns to land, labor, capital, machinery, overhead, risk, and management computed by deducting total operating cost from gross or total receipts. The capital re-

Table 1. Cost and returns budget. Valencia orange budget for interior twenty five year old grove.

Category	Units	Price	Quantity	Value	Your Value
Production:					
Valencia oranges	box	5.000	400.000	2000.00	_____
Total receipts				2000.00	_____
Operating inputs:					
Kelthane	pt.	1.330	16.000	21.28	_____
Zinc	lbs.	0.410	16.000	6.56	_____
Boron	lbs.	0.470	1.250	0.59	_____
Manganese	lbs.	0.150	15.000	2.25	_____
Sticker	pt.	0.900	1.000	0.90	_____
Ethion	pt.	2.060	6.000	12.36	_____
Oil	gal.	2.150	6.000	12.90	_____
Copper	lbs.	1.030	3.000	3.09	_____
Sulfur	lbs.	0.120	70.000	8.40	_____
Krovar II	lbs.	6.580	2.000	13.16	_____
Complete fert.	lbs.	0.060	1130.000	67.80	_____
Complete fert.	lbs.	0.050	40.000	2.00	_____
Dolomite	lbs.	0.010	700.000	7.00	_____
Trees	TRE	3.250	1.400	4.55	_____
Tree wrap	WRP	1.000	1.400	1.40	_____
Gas, fuel	gal.	1.100	7.000	7.70	_____
Diesel	gal.	1.100	76.250	83.87	_____
Tractor fuel & lube	acre			21.20	_____
Tractor repair cost	acre			10.13	_____
Equip. fuel & lube	acre			20.10	_____
Equip. repair cost	acre			3.81	_____
Total operating cost				311.04	_____
Returns to land, labor, capital, machinery, overhead, risk, and management				1688.96	_____
Capital cost:					
Annual operating capital		0.140	111.383	15.59	_____
Tractor investment		0.140	95.808	13.41	_____
Equipment investment		0.140	64.898	9.09	_____
Total interest charge				38.09	_____
Returns to land, labor, machinery, overhead, risk and management				1650.86	_____
Ownership cost: (depreciation, taxes, insurance)					
Tractor	hr.			18.17	_____
Equipment	hr.			15.19	_____
Total ownership cost				33.36	_____
Returns to land, labor, overhead, risk and management				1617.51	_____
Labor cost:					
Machinery labor	hr.	4.500	9.403	42.31	_____
Other labor	hr.	4.500	1.500	6.75	_____
Irrigation labor	hr.	3.250	0.264	0.86	_____
Total labor cost			11.167	49.92	_____
Returns to land, overhead, risk and management				1567.58	_____
Land charge or rent:					
Land investment	acre	0.0	0.0	0.0	_____
Land taxes	acre			0.0	_____
Total land charge				0.0	_____
Returns to overhead, risk and management				1567.58	_____

quirements, capital cost, and returns to land, labor, machinery, overhead, risk, and management is subsequently shown followed by a printing of the machinery ownership costs and another returns statement. Total operating capital required is the sum of total cash operating expense. Total capital requirements are estimated for each of the 12 months and are converted to an annual basis by determining how long each expense is invested before it is recovered through the sale of all or part of the enterprise's production. The amounts of tractor and equipment capital computed on a per acre basis are added to the annual capital to arrive at total capital required for the budget, and is multiplied by the interest rate to obtain capital cost. The total ownership cost for the machinery and equipment operations (depreciation, insurance, and taxes) is computed in a machinery costs per acre subroutine within the budget generator.

The next items are the costs of machinery, irrigation, and other labor, and the resulting returns to land, overhead, risk, and management. The hours of machinery labor and irrigation labor computed by the machinery costs per acre subroutine are multiplied by the specified machinery labor and irrigation labor prices to yield the total cost of machinery and irrigation labor. The number of hours of other labor specified by the grove owner are multiplied by the per hour price to get the total other labor cost. The hourly labor charges are specified by the grower. The three labor costs are summed to yield a total labor cost. Land charges and rents can also be specified and incorporated into

the budget, however no land charges were included in this budget. The final line is returns to overhead, risk, and management. Since the citrus trees are not explicitly included in the budget printout, except for replacement trees as a variable input, the last returns statement should properly include trees.

Enterprise budgets are a management tool and provide only guideline information. Consequently, blanks are included along the right margin so that users can rework the budget without benefit of a computer.

Another format of the costs and returns budget includes annual operating capital and labor charges in the variable inputs section. The values (prices times quantities) are summed to obtain total operating cost. Total fixed costs include the capital (interest) and ownership (depreciation, taxes, and insurance) costs for the machinery and equipment, irrigation system, and land. Again no land charges nor value of the trees are included so the returns above all costs except overhead, risk, and management also includes returns above land and orange trees. Along the right margin, blanks are included for additional notes, corrections, or input.

A third budget format, as shown in Table 2, is a total cost budget with the capability of subtracting out landlord or opportunity costs, land costs, and the allocation of government payments between landlord and tenant. This agendum also separates harvest and preharvest costs to facilitate financial planning. The total variable costs are subtracted from gross receipts to get income above variable

Table 2. Total cost budget.

	Unit	Price or cost/unit	Quantity	Value or cost
1. Gross receipts from production valencia oranges	box	5.00	400.00	\$2000.00
Total				\$2000.00
2. Variable costs				
Preharvest				
Kelthane	pt.	1.33	16.00	\$ 21.28
Zinc	lbs.	0.41	16.00	6.56
Boron	lbs.	0.47	1.25	0.59
Manganese	lbs.	0.15	15.00	2.25
Sticker	pt.	0.90	1.00	0.90
Ethion	pt.	2.06	6.00	12.36
Oil	gal.	2.15	6.00	12.90
Copper	lbs.	1.03	3.00	3.09
Sulfur	lbs.	0.12	70.00	8.40
Krovlar II	lbs.	6.58	2.00	13.16
Complete fert.	lbs.	0.06	1130.00	67.80
Complete fert.	lbs.	0.05	40.00	2.00
Dolomite	lbs.	0.01	700.00	7.00
Trees	TRE	3.25	1.40	4.55
Tree wrap	WRP	1.00	1.40	1.40
Gas, fuel	gal.	1.10	7.00	7.70
Diesel	gal.	1.10	76.25	83.87
Machinery	acre	45.53	1.00	45.53
Tractors	acre	9.70	1.00	9.70
Labor (tractor & machinery)	hour	4.50	9.40	42.28
Labor (irrigation)	hour	3.25	0.26	0.86
Other labor	hour	4.50	1.50	6.75
Interest on op. cap.	dol.	0.14	111.86	15.66
Subtotal, pre-harvest				\$ 376.59
Harvest costs				\$
Subtotal, harvest				\$ 0.0
Total variable cost				\$ 376.59
3. Income above variable costs				\$1623.41
4. Fixed costs				
Machinery	acre	45.95	1.00	\$ 45.95
Tractors	acre	9.91	1.00	9.91
Total fixed costs				\$ 55.86
5. Total costs				\$ 432.45
6. Net returns				\$1567.55

costs; the addition of total variable and total fixed costs to obtain total costs is subtracted from total receipts to yield net returns.

An estimate of several breakeven prices is available as shown in Table 3. These breakeven prices are obtained for any particular input or product as requested or specified by the grower. For instance, the breakeven price to cover variable inputs if 400 boxes of Valencias are produced is \$0.78 per box.

Table 3. Breakeven prices agendum.

Breakeven Prices		
IF	400.00 box Valencia Oranges are Produced:	
	To cover variable inputs	0.778
	To cover variable inputs and interest	0.873
	To cover variable inputs and labor	0.902
	To cover variable inputs interest and labor	0.998
	To cover all costs except land overhead risk and management	1.081

Budget background information can also be presented as an option printout. Included is a summary of the input data provided by the citrus grower as well as a monthly summary of receipts and expenses, monthly totals of annual capital requirements, monthly labor requirements in hours, and a summary of fixed and variable cost components for machinery by machine. Consequently, a grower can use this monthly summary to analyze his cash flow and his resource needs, specifically labor, to aid in his financial and personnel management, as well as inform his lenders when and in what amounts he will likely repay debt. In addition, there is a summary of fixed costs, variable costs, and labor requirements for the budget by machine sequence, and a summary of the machinery and equipment information used to prepare the budget.

A detailed monthly cash flow summary and budget can also be depicted. This format includes a printing of the monthly distribution of commodities produced and their values, a monthly distribution of quantities of input items and their costs, a monthly distribution of total costs, and a return to land, labor, capital, machinery, overhead, risk, and management (and trees, although not stated).

A summary of fuel consumption by the enterprise is another budget printout option. For each machine that has its own motor, the gallons of fuel consumed per hour is printed and, for each machine used, the gallons of fuel required to cover one acre is computed. Finally, a summary containing the gallons of fuel used monthly for the various operations or activities is tabulated.

A table of net returns (Table 4) is available when two input or output prices, two quantities, or a price and

Table 4. Sensitivity or range analysis.

Income above variable costs						
When the price of Valencia oranges ranges from 3.00 to 5.00 and the quantity of Valencia oranges range from 300.00 to 500.00						
		Price of Valencia Oranges				
		3.00	3.50	4.00	4.50	5.00
Quantity of Valencia oranges	300.00	423.41	623.41	823.41	1023.41	1223.41
	350.00	623.41	823.41	1023.41	1223.41	1423.41
	400.00	823.41	1023.41	1223.41	1423.41	1623.41
	450.00	1023.41	1223.41	1423.41	1623.41	1823.41
	500.00	1223.41	1423.41	1623.41	1823.41	2023.41

quantity are varied. The range of net returns shown in Table 4 is based upon the value of income above variable costs per acre at different prices and yields of Valencia oranges.

The computerized citrus enterprise budget allows the grower to analyze the effect of alternative production practices, such as the timing of selected sprays, the use of irrigation, or hedging and topping, as well as alternative financial decisions, such as borrowing capital at different interest rates, purchasing equipment, or prepayment of debt. The computerized budget also permits the evaluation of individual taxable income levels and changes in the income tax legislation. For instance, as a part of the Tax Reform Act of 1981, the Accelerated Cost Recovery System changes the depreciation basis and shortens the useful life on most depreciable assets placed into service effective the 1981 tax year. Furthermore, the depreciation basis of all assets of the grove is calculated from the purchase price with no salvage value.

For machinery and equipment, the market value is easily obtained. However, determining the value for citrus trees is more detailed. Assuming a \$10,000 per acre market value for a Valencia grove with fruit, the values of the fruit crop and the land must be deducted. The fruit crop is valued at \$1,540 per acre [\$/box x 400 boxes x 77% maturity] and the land is valued at \$2,115 per acre [\$10,000 - fruit crop 2 \$1,540 x 25% IRS allowance]. The total of these values (\$3,655) subtracted from the market value of \$10,000 leaves a depreciation basis of \$6,345 per acre. Although not shown on the budgets, the appropriate depreciation cost of the trees based on either a 20-year or a 5-year depreciation schedule must be included in any returns or investment considerations. The increase in depreciation costs which reduce grower returns can be charged against taxable income to lower a grower's income tax liability. When a reduced income tax liability is considered, the grower may actually benefit from a shortened depreciation schedule.

### Summary

Variations among groves and grove practices eliminate the possibility of finding all factors that are responsible for the yields, returns, and profits of the best groves. The success of the Florida orange grower as he faces production, financial, and tax management decisions in an era of price and marketing uncertainty will be influenced by a changing structure and competitive situation throughout much of the 1980's. The Florida orange grower's financial position and success in the years ahead may depend on the successful planning and evaluation of grove management practices.

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