

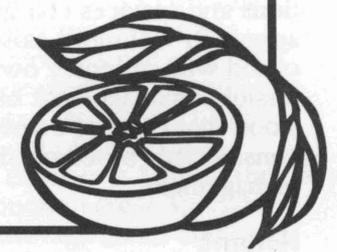


Texas Agricultural Extension Service

The Texas A&M University System

Texas Citrus Grapefruit Orchard Establishment Costs – Years 1 to 3

Merritt J. Taylor*



Two devastating freezes in the decade of the '80s (1983 and 1989) gave impetus for radical readjustment of the citrus industry in the Rio Grande Valley of Texas. Prior to the 1983 freeze, the citrus industry in the Lower Rio Grande Valley was tied to large investments in groves that were not providing returns comparable to alternative agricultural investments. Growers recognized that there were new varieties, ownership arrangements, planting schemes and production systems that would increase profit potential of the land resource but were unable to make the costly changes. Following the two freezes the industry recovered by vigorously reestablishing productive land with newer, more marketable varieties, more sophisticated production and management systems, and better ownership schemes.

The freeze in December 1983 resulted in a loss of about 70 percent of the citrus trees from approximately 69,000 acres to 22,000 acres. In addition, those trees that remained alive required extensive rehabilitation. Production was virtually zero in the 1984-85 season. In the ensuing three years production reached about 2 to 3, 18 to 20 and 35 to 40 percent of pre-freeze levels, respectively, on rehabilitated trees.

The 1989 freeze reduced the live tree acreage to approximately 12,000 acres. Production in 1990 was zero as industry leaders again began rehabilitation of surviving trees (many of which were survivors of the '83 freeze). Much of the nursery stock was damaged or destroyed by this freeze which slowed immediate reestablishment of highly productive fields. Grapefruit varieties planted tended heavily toward the newer redder varieties such as Rio Red and Star Ruby. Orange varieties were mixed with Valencia and navel plantings.

The availability of comparatively inexpensive suitable land, water resources, skilled management and other economic factors has attracted an increasing number of investors interested in reestablishing a major part of the Texas citrus industry as a commercial business enterprise rather than as a retirement investment. **This is a major structural change in the ownership of the Texas citrus industry.**

Citrus orchard production is a capital and labor intensive, long-term enterprise. Grapefruit orchard establishment often requires 3 to 4 years to obtain effective production and it takes 8 to 9 years to recapture the accumulated expenses. Costs of entry, however, are highly variable and depend on orchard size, land quality, equipment available and the owner's management capabilities.

The objective of this paper is to outline the economic factors that affect the establishment and operation of a grapefruit orchard through the first 3 years. This will include the expected costs and returns for the specific case of a relatively small-acreage, high-technology, commercial operation with professional management.

Assumptions

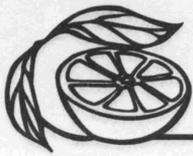
The data used to support this publication were collected from orchard owners, orchard managers, grove care companies, research scientists, agribusinessmen, Texas A&M-Kingsville Citrus Center personnel and Texas A&M University Extension and Research specialists.

Land Tenure

The three most common types of citrus operations in the Lower Rio Grande area are:

- 1) grove care management services for investor-owned orchards;
- 2) owner-managed with major equipment operations performed by use of custom services; and

*Professor and Extension economist-management, Texas Agricultural Extension Service, The Texas A&M University System.



3) complete owner/operator-managed orchards.

This paper will concentrate on the first category where equipment and services are provided by the grove care company with major spray operations and services charged at a custom rate. This approach will more closely reflect the costs associated with absentee ownership contracting professional management of the grove. It is understood that costs of owner management would vary considerably based on size of grove and skill of management.

Returns

Returns are to ownership and risk.

Management Charges

The method utilized by grove care companies for management charges varies with as many grove care companies that exist in the Rio Grande Valley. Some assess a monthly management charge with reduced charges on the cultural operations while other companies charge no management fee but include the overhead and management costs in the custom operation costs. Ultimately, the only effective method of evaluating the costs is by comparing total costs. This paper includes both modest management charge and custom rates tables which may include some overhead charges.

Orchard Size

A hypothetical 20-acre orchard model is used throughout this study, but the costs are discussed on a cost-per-acre basis. It was necessary to select an historically economic unit because high management and equipment requirements and the operation size form a substantial influence on establishment costs. It is understood that a larger tract of land probably would reduce the cost-per-acre charges for equipment and cultural operations in an owner/manager situation.

Soil and Irrigation

It is assumed that the orchard will be established on alluvial soil in an area previously occupied by a producing orchard and needing no drainage system. Rio Grande water supplied through existing water districts will be used as a primary water source, applied through a permanent valve irrigation system. While several groves have begun to consider micro-jet irrigation systems for irrigation, water conservation and freeze protection, this paper will not address this topic.

Orchard Characteristics

The management unit is a 20-acre orchard with a tree density of 145 trees/acre.

Costs and Prices

The establishment costs are based on Fall 1993 costs. Citrus fruit sales are estimated from 1993 - 1994 shipping season and average \$125 per ton. Grapefruit tree insurance is based on the Zone 2 rate structure.

Miscellaneous

The study assumes that the equipment, labor and other supplies will be obtained specifically for the orchard establishment and operation by the grove care company and will be charged out at acceptable custom rates. Harvesting will be conducted and paid for by the buyer.

Chemical Usage

Herbicide and pesticide usage varies from year to year and is highly related to seasonal rainfall, seasonal temperature, wind velocity, surrounding crops and pest migrations.

Tax Issues

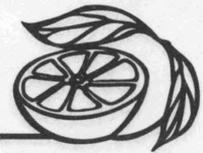
This study does not address income tax issues as these implications should be addressed in the context of the total business and with specialized professional assistance.

Investment Warning

The values provided in these budgets represent an average of the costs and returns obtained from growers and grove care managers. They do not represent the costs and returns of any particular orchard. Potential investors should modify these estimates and adapt them to more accurately describe a specific operation.

Land Preparation

Land preparation is the first consideration after site selection and orchard planning. It is suggested that custom-hire operators be used because heavy equipment is required and equipment purchase or lease considerations appear too expensive for a 20-acre tract. Custom-hire costs are highly variable and depend on the availability of custom-hire operators to provide required services in a particular area. The costs for the various land preparation activities varied 20 percent to 30 percent between operators surveyed. Land preparation and leveling costs of an orchard that had previously been planted in citrus averaged \$150 per acre.



Grapefruit Orchard Establishment Costs – Year 1

Table 1 provides an estimate of the costs in the initial establishment year that includes land preparation, land leveling, tree purchasing, tree planting, tree wrapping and applying fungicide and insecticide. The orchard will require approximately \$1,808 per acre in variable costs and \$265 per acre in overhead costs for a total of about \$2,073 per acre.

Grapefruit Orchard Development and Operation Costs – Years 2 and 3

Table 2 provides an estimate of the costs and returns to continue development and to operate the orchard during the second and third years after establishment. An extremely small amount of production should be observed the second year, assuming well developed trees were planted, with a small but larger amount of production available for harvest in the third year. During the first year of economic production (year 3), variable production costs will average about \$697 per acre with overhead costs averaging about \$451 per acre for a total projected cost of about \$1,148 per acre.

Table 1. Grapefruit Orchard Establishment (Year 1) Lower Rio Grande Valley of Texas; 1994 Projected Costs and Returns Under Commercial Grove Care Management (145 Trees per Acre).

Gross Income Description	Quantity	Unit	\$ / Unit	Total
Warning - No gross receipts	0.000 tons		\$125.00	\$0.00
Variable Cost Description	Quantity	Unit	\$ / Unit	Total
Year 1				
Land Prep and Level	1.00	acre	\$150.00	\$150.00
Trees	145.00	tree	4.00	580.00
Layout, Plant	145.00	tree	1.25	181.25
Tree Wrap	145.00	tree	1.00	145.00
Fung-Insec + (Treat & Wrap Labor)	145.00	tree	1.00	145.00
Tree Insurance	1.00	acre	37.95	37.95
Nitrogen (Actual N)	17.00	lb.	0.37	6.29
Fertilizer Application	4.00	appl	4.00	16.00
Preemerge Herbicide	2.00	appl	38.00	76.00
Preemerge Herbicide Application	2.00	appl	20.00	40.00
Spot Herbicide	2.00	appl	9.00	18.00
Spot Spray Application	2.00	appl	15.00	30.00
Pesticides	2.00	appl	27.00	54.00
Pesticide Application	2.00	appl	35.00	70.00
Irrigation Water	7.00	irri	8.00	56.00
Irrigation Labor	5.00	hour	9.50	47.50
Total Preharvest Year 1				\$1,652.99
Interest - OC Borrowed	\$1,291.78	Dol.	0.12	\$155.01
Total Variable Cost				\$1,808.00
Gross Income minus Variable Cost				(\$1,808.00)
Fixed Cost Description		Unit		Total
Misc Admin & Overhead	1.00	Acre	\$35.00	\$35.00
Interest Rate For Amortized Investments	0.09%			
Irrigation System (Permanent Valve)	\$350.00	Acre 15 Yr Recov		43.42
Land	1,500.00	Acre 15 Yr Recov		186.09
Total Fixed Cost				\$264.51
Total of All Cost				\$2,072.51
Net Projected Returns to Risk and Ownership Per Acre				(\$2,072.51)

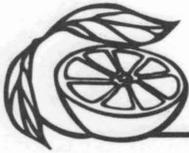


Table 2. Grapefruit Orchard Establishment (Years 2 and 3) Lower Rio Grande Valley of Texas; 1994 Projected Costs and Returns Under Commercial Grove Care Management (145 Trees Per Acre).

Gross Income Description	Establishment (Year 2)				Establishment (Year 3)			
	Projected Yield	Unit	\$/Unit	Value	Projected Yield	Unit	\$/Unit	Value
Grapefruit	0.200	Tons	\$125.00	\$25.00	3.0	Tons	\$125.00	\$375.00
								\$375.00
Variable Costs Description	Quantity	Unit	\$/Unit	Total	Quantity	Unit	\$/Unit	Total
Year 2					Year 3			
Preharvest								
Tree Insurance	1.00	acre	\$69.00	\$69.00	1.0	acre	\$92.00	\$92.00
Nitrogen (Actual N)	35.00	lb.	0.37	12.95	74.0	lb.	0.37	27.38
Fertilizer Application	4.00	appl	4.00	16.00	3.0	appl	4.00	12.00
Preemerge Herbicide	2.00	appl	38.00	76.00	2.0	appl	38.00	76.00
Preemerge Herbicide Application	2.00	appl	20.00	40.00	2.0	appl	20.00	40.00
Spot Herbicide	2.00	appl	9.00	18.00	2.0	appl	9.00	18.00
Spot Spray Application	2.00	appl	15.00	30.00	2.0	appl	15.00	30.00
Pesticides	3.00	appl	37.00	111.00	3.0	appl	42.00	126.00
Pesticide Application	3.00	appl	35.00	105.00	3.0	appl	35.00	105.00
Irrigation Water	7.00	irri	8.00	56.00	7.0	appl	8.00	56.00
Irrigation Labor	6.00	hours	9.50	57.00	7.0	hours	9.50	66.50
Tree Replacement	1.00	tree	8.00	\$8.00				
Wrap and Unwrap Trees	1.00	acre	70.00	70.00				
Total Preharvest Year 2				\$668.95	Year 3			\$648.88
Interest - OC Borrowed	\$453.41	dol.	0.12	54.41	\$399.78	dol.	0.12	47.97
Total Variable Costs				\$723.36				\$696.86
Breakeven Price for Variable Costs					\$232.29 per ton of Grapefruit			
Gross Income minus Variable Cost				(\$723.36)				(\$321.86)
Fixed Cost Description	Unit		Total		Unit		Total	
Misc Admin & Overhead	1.00	acre	35.00	35.00	1.00	acre	\$35.00	\$35.00
Interest Rate for Amortized Investments	9.00%		9.00%					
Irrigation System (Permanent Valve)	\$350.00	acre	15 Yr Recov	43.42	\$350.00	acre	15 Yr Recov	43.42
Land	\$1,500.00	acre	15 Yr Recov	186.09	\$1,500.00	acre	15 Yr Recov	186.09
Perennial Crop (1st Year Establishment Costs)	\$2,072.51	acre	Annual Interest	186.53	\$2,072.51	acre	Annual Interest	186.53
Total Fixed Cost				\$451.04				\$451.04
Total of All Cost				\$1,174.39				\$1,147.89
Net Projected Returns to Risk and Ownership per Acre				(\$1,149.39)				(\$772.89)
Breakeven Price for Total Costs					\$382.63 per ton of Grapefruit			

The information given herein is for educational purposes only. Reference to commercial products or trade names is made with the understanding that no discrimination is intended and no endorsement by the Cooperative Extension Service is implied.

Educational programs of the Texas Agricultural Extension Service are open to all people without regard to race, color, sex, disability, religion, age or national origin.

Issued in furtherance of Cooperative Extension Work in Agriculture and Home Economics, Acts of Congress of May 8, 1914, as amended, and June 30, 1914, in cooperation with the United States Department of Agriculture. Zerle L. Carpenter, Director, Texas Agricultural Extension Service, The Texas A&M University System.